

**The Contributions of Process Versus Outcome Focus and Age to  
Self-Regulation During Goal Pursuit**

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## ABSTRACT

The work summarized in this thesis applies the “motivation-as-cognition”-paradigm (Kruglanski et al., 2002) as well as a life-span developmental perspective (e.g., Goulet & Baltes, 1970) to the study of self-regulation during the pursuit of personal goals and reactions to failure. This work examines how *goal focus* (i.e. the cognitive representation of means vs. desired outcomes of goal pursuit) and *age* are associated with affective, cognitive and behavioral self-regulation during goal pursuit and especially after experiencing failure. Adopting a multi-method approach, the following questions were investigated: Is a focus on the means of goal pursuit (*process focus*) generally more adaptive for goal-directed self-regulation and subjective well-being than a focus on the outcomes (*outcome focus*; *Part I*)? Are the two goal foci related to different reactions to failure (*Part II*)? How and why might goal focus change across the lifespan (*Part III*)? Are older adults more process-focused than younger adults who, in turn, are more outcome-focused (*Part IV*)? Finally, are older adults better at self-regulating their behavior, affect and cognition during goal pursuit than younger adults, especially after experiencing failure (*Part V*)?

Studies have supported the hypotheses that a process focus is more adaptive for affective, cognitive and behavioral self-regulation than an outcome focus. Adults also seemed to profit from a process focus when encountering failure (and success). In contrast to younger adults, older adults focused more strongly on the process of goal pursuit than on its outcomes. A process focus appeared to be more adaptive than an outcome focus irrespective of age. Older adults were more successful in self-regulating their behavior, affect, and thought during goal pursuit than younger adults, especially after failure.

Finally, an overall discussion will address shortcomings of the present studies and theoretical implications for discrepancy theories of motivation and the study of self-regulation over the life span. Suggestions for future research directions will be proposed and possible practical implications shall be explored.

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## INTRODUCTION

Self-regulation is the capacity to alter one's own responses, and it is essential for the successful pursuit of long-term goals (Baumeister, Vohs, & Tice, 2007). For example, someone who intends to lose weight will continuously face situations in which he or she should resist the temptation of tasty and high caloric food for the sake of his or her body shape. Similarly, a person who needs to start preparing for an exam must overcome the urge to rather watch TV or hang out with friends for the purpose of obtaining a future university degree. However, effective self-regulation is not only a means for the successful pursuit of goals; it also *depends* on the goal representations one has (Forgas, Baumeister, & Tice, 2009). For example, abstract regulatory objectives such as preparing well for an exam may best be pursued when people are able to translate them into concrete goals, namely, studying five hours every day (e.g., Locke & Latham, 2002; McCrea, Liberman, Trope, & Sherman, 2008).

Due to the interdependence of self-regulation and goal pursuit, the present research aims to treat both constructs as an integrated whole. In line with the proposition that motivated behavior can best be understood from a cognitive perspective (Kruglanski et al., 2002), this research project investigates how the cognitive representation of a goal affects self-regulation during goal pursuit. In particular, this thesis addresses the following questions: Is the representation of goals in terms of the means of goal pursuit (i.e., process focus) rather than in relation to the desired outcomes (i.e., outcome focus) of goal attainment advantageous for goal-directed self-regulation? Is it significantly more advantageous after failure? Does goal focus evolve during the adult life span? What are the effects of age on self-regulation? Does the capacity to regulate oneself improve across the adult life span?

Before embarking on an introduction pertaining to the details of these abovementioned questions, I find it more fruitful to thoroughly discuss the goal concept and how goals are constructed of both means and desired outcomes.

### Personal goals as knowledge structures

Goals can be defined as knowledge structures that entail information about desired outcome states and the means of attaining them (Kruglanski, 1996; Kruglanski et al., 2002). Cognitive representations of outcomes and means are associated by lateral interconnections between means, lateral interconnections between outcomes, as well as by vertical means-ends relations. Interconnections can be inhibitory between mutually exclusive means, e.g., eating healthy versus taking steroids to look better, and between mutually exclusive outcomes, e.g., achieving eating enjoyment versus weight loss. They can also be facilitative between means that serve the same outcome, e.g., exercising and dieting, or outcomes that facilitate each other, e.g., losing weight and improving one's physical health.

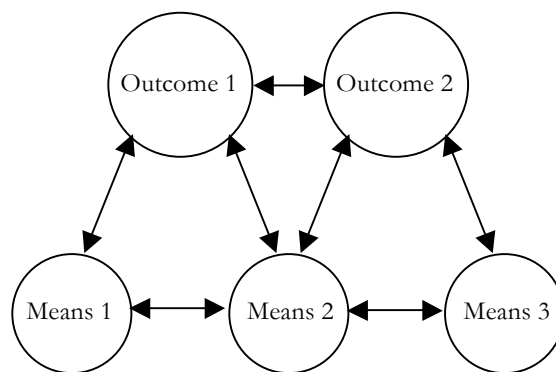


Figure 1: A two-level system of means and outcomes (adapted from Kruglanski et al., 2002)

The way that goal systems affect goal-directed behavior is dependent on the structural arrangement of means and outcomes (Kruglanski et al., 2002, see Figure 1). The principle of *equifinality* implies that a goal may be attained via multiple means and actions as illustrated by the proverb of “many roads lead to Rome” (Kruglanski, 1996; Kruglanski et al., 2002). Accordingly, a particular means that has not successfully attained an outcome may be substituted by an alternative means. As depicted in Figure 1, means 1 and 2 both serve outcome 1. For example, when pursuing the goal to lose weight, the means of dieting may be substituted by the alternative



means of exercising. In addition, the principle of *multifinality* suggests that one means can serve multiple outcomes (Kruglanski et al., 2002). In Figure 1, means 2 serves outcomes 1 and 2. For example, exercising may improve one's body shape, as well as one's physical health. As in the case of failing to improve one's body shape with exercise, one might continue exercising whilst substituting the goal and choosing to persist with an exercise program for the sake of one's physical health (Kruglanski & Jaffe, 1988).

According to Kruglanski et al. (2002), the strength of an interconnection between two elements of a goal system is positively related to its uniqueness<sup>1</sup>. The more means are associated with an outcome (equifinality) and/or the more outcomes are associated with a particular means (multifinality), the weaker each of the single means-outcome interconnections becomes. As has been shown experimentally, the less substitutable one's means for a certain outcome, the more easily it comes to mind after one is primed with the respective outcome (Kruglanski et al., 2002). In other words: the less means there are for attaining a particular outcome, the easier each of these means will be cognitively activated when contemplating how to pursue the outcome. Similarly, the more multifinal a means is, the less instrumental it is when considered with respect to each of the possible outcomes (Zhang, Fishbach, & Kruglanski, 2007). For example, a smartphone might be viewed as multifunctional since it can be used to write text messages, make calls, surf the Internet, and to take photos; however, when thinking about a useful instrument for taking photos, one is more likely to consider a digital camera first.

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<sup>1</sup> Kruglanski et al. (2002) put forth that this effect is analogous to the “fan effect” in other knowledge structures as demonstrated by Anderson (1974, 1983). However, whereas Kruglanski et al. assume a direct association between the *strength* of an interconnection and its uniqueness, Anderson assumes that the less unique an interconnection is, the more it has to compete with other interconnections for *activation*, whereas the strength of each interconnection itself should not be reduced.

### **The hierarchical organization of goals**

Means and ends can also be described as being hierarchically related (Carver & Scheier, 1981; Emmons, 1996; Little, 1989; Vallacher & Wegner, 1987). The means (or subgoals), e.g., dieting, are subordinate to their respective outcomes (or superordinate goals), e.g., losing weight. According to the definition of means, means must be deployed in order to achieve outcomes; there is a causal and sequential relationship implied in their hierarchical arrangement. Moreover, higher-level elements are more important than lower level elements (Austin & Vancouver, 1996; see also Newman & Taylor, 1992). However, means may only be defined as means in their relation to a higher-order outcome. The relation of means and outcomes is relative within one specific two-level arrangement because each outcome (e.g., weight loss) may itself be a means for achieving another higher-level outcome (e.g., attractiveness).

### **Process and outcome goal focus**

The foundation of this thesis is based on the assumption that there exists a substantial inter- and intraindividual variation in how much people think about the lower and more concrete level of means of goal pursuit as compared to the higher and more abstract level of desired outcomes of their goals (i.e., goal focus, Sansone & Thoman, 2005; Pham & Taylor, 1999; Zimmerman & Kitsantas, 1997, 1999). Process focus is defined as the relatively higher cognitive accessibility of the means of goal pursuit. Outcome focus is defined as the relatively higher cognitive accessibility of the desired outcomes (Freund, Hennecke, & Riediger, 2010). This relative accessibility of means and ends can vary among people, goals, and different phases of goal pursuit (Freund, Hennecke, & Mustafic, under review). For example the goal “losing weight” can either be primarily represented in terms of its outcomes, e.g., as “being attractive” and “being healthy”, or in terms of the concrete processes or means it entails, such as “dieting” and “exercising.”

It is important to stress that goal focus may be defined in relative terms, as a relatively higher accessibility of either the means or the outcomes, because both means and outcomes

define a goal. Furthermore, it is an essential feature of the goal system that activation spreads top-down from the outcomes to the means, as well as bottom-up from the means to the outcomes. To explore this assumption, Shah and Kruglanski (2000; 2003) have employed a lexical decision task that used either desired outcome states as primes and their respective means as targets or vice versa. As indicated by shorter reaction times to the targets, outcomes that are currently desired prime their means and means prime their respective outcomes. In line with this reasoning, we point out that the complete representation of a goal entails both the accessibility of means and outcomes to some degree. Nevertheless, we state that there are differences in the relative accessibility of each goal level.

Research pertaining to action identification (Vallacher & Wegner, 1987, 1989) currently supports the idea that there is within- and between-person variance as to whether people represent an action in terms of its higher-level outcomes or in relation to the lower-level processes or means it entails. In a questionnaire designed by Vallacher and Wegner (the “Behavior Identification Form”, 1989), participants had to select one out of two descriptions for 25 behaviors (e.g., “making a list”), one representing a lower level identification (“writing things down”) and the other reflecting a higher level action identification (“getting organized”). Across the 25 items, 40 to 89 % of the sample chose the higher-level identity, attesting to a substantial variation among actions and between subjects. Nevertheless, Vallacher and Wegner (1989) concluded from the overall response tendencies in the questionnaire and their experimental research (Wegner, Vallacher, Kiersted, & Dizadji, 1986; Wegner, Vallacher, Macomber, Wood, & Arps, 1984) that people seem to display a general tendency to embrace the higher-level outcome-related identity and to focus on the meaning, the larger effects or the implications of their behavior, rather than on its underlying processes (see also Escalas & Luce, 2004).

### **The effects of process and outcome goal focus on self-regulation**

As previously reported, focusing on outcomes rather than on means appears to be the “default” mindset. Nevertheless the following question still remains: Which focus is actually

## Introduction

more instrumental for self-regulation during goal pursuit? The self-help literature maintains that focusing on and imagining the desired outcome is the key to successful goal attainment (e.g., Dyer, 2001). Peale (1982) gives the following instructions:

*“Hold the image of yourself succeeding, visualize it so vividly, that when the desired success comes, it seems to be merely echoing the reality that has already existed in your mind.”* (p. 15)

Such recommendations however tend not to be based on empirical research and lack process models that can explain the mechanisms by which thinking about a desired outcome could enhance a person’s likelihood of actually achieving it (Taylor, Pham, Rivkin, & Amor, 1998). In the absence of specific plans regarding how to pursue the goal it is questionable whether outcome thinking is much more than simple fantasy. Consequently, fantasy may not lead to instrumental goal-directed behavior (Oettingen & Mayer, 2002).

Indeed, empirical evidence pertaining to the adaptiveness of either outcome focus or process focus is rather mixed. Various studies suggest that a process focus is more beneficial than an outcome focus. For example, students who mentally simulate the process of studying for an exam appear to benefit from this mental simulation because they have been shown to study more hours and to obtain higher exam scores (Pham & Taylor, 1999). In contrast, students who mentally simulate the feeling of receiving a good grade on an exam do not perform well, in comparison to a control group without any simulation (Pham & Taylor, 1999). Research dedicated to implementation intentions suggests that deliberately thinking about the conditions under which means of goal pursuit can be implemented does promote successful goal attainment (e.g., Gollwitzer, 1993; Gollwitzer & Brandstätter, 1997). Moreover, when a task becomes difficult or failure is experienced, people do not only switch their initially predominant outcome focus to a process focus (Vallacher, Wegner, & Frederick, 1987; Wegner & Vallacher, 1983). When goal pursuit is difficult or failure is experienced, such focusing on the process also seems to be adaptive not only to the actual performance but also to the subjective satisfaction with

one's performance, as well as to one's affective state (Houser-Marko & Sheldon, 2008; Vallacher, Wegner, & Samoza, 1989; Wegner et al., 1984). In line with the proposition that the adaptiveness of goal focus depends on the task difficulty, a shift from process to outcome goals over time seems to be more beneficial when people acquire new skills (Zimmermann & Kitsantas, 1997, 1999). Obviously, when learning to master a new task the means have to be acquired or mastered first before performance levels can become the focus of attention.

There also exist alternative research studies, which provide support for the adaptiveness of outcome focus. Vallacher et al. (1989) have shown that, as long as a task is relatively easy, an outcome focus might lead to better results. Moreover, it has been argued that when people have previously exerted self-regulation, reflecting upon their behavior in terms of the means and resources they have invested, can lead them to invest less resources in subsequent self-regulatory tasks. Conversely, a focus on higher-level construals, can reduce the focus on resources that have already been invested, and lead individuals to focus on their self-regulatory goals or, in other words, on the outcomes they want to attain. Meanwhile, this can improve their self-regulation in subsequent tasks (Agrawal & Wan, 2009). Thompson, Hamilton, and Petrova (2009) have also argued that in consumer decision-making situations, process-oriented thinking may not payoff. Thompson et al. propose that process-oriented thinking may result in the means becoming more salient while end benefits may continue to remain important because thinking about ends occurs naturally (Escalas & Luce, 2004; Vallacher & Wegner, 1987; Wegner et al., 1986; Liu, 2008). In addition, asking people to think about the outcome tends to reinforce their natural way of thinking; however, asking them to consider the process leads to the addition of this component to their initial outcome focus. Overall, this results in a focus on both outcomes and means. Escalas and Luce as well as Thompson et al. posit that if consumers have both outcomes and means in mind, they are more likely to recognize substantive trade-offs between means (e.g., the ease of use of a camera) and end benefits (e.g., various functions of a camera). Consequently, this may lead consumers to experience more decision difficulty, that is, a greater willingness to

postpone making a choice, a lower commitment to the chosen option, as well as degraded task performance. However, whilst the authors consider this to be maladaptive – and from the perspective of a consumer psychologist this may be the case – it is not maladaptive to reconsider the trade-off between the desirability of a goal on the outcome level and its feasibility on the means level when deciding which personal goals a person would like to pursue (Emmons, 1996). In this case, decision difficulty might reflect the intensity by which a person considers means and outcome-related information. This should be observed in the quality of the decision; it may pay-off when people select long-term goals to pursue. Whereas Thompson et al. (2009) argue that having both the process and the outcome in mind can be maladaptive, other researchers have argued that if a person bears the outcome and the process in mind during goal pursuit, then they may yield the best results (Pham & Taylor, 1999). Moreover, it is curious, why only a process-focused manipulation should lead to a focus on both means and outcomes. As previously mentioned, research within the framework of goal-systems theory has demonstrated that activation spreads both bottom-up from the means to the outcomes, as well as top-down from the outcomes to the means (Kruglanski et al., 2002). Accordingly, contemplation of an outcome should to some degree also co-activate the related means (Shah & Kruglanski, 2000).

In summary, research has produced mixed results regarding the relative adaptiveness of process and outcome focus. Seemingly, an outcome focus is adaptive in the following four conditions: First, if the task at hand is easy to master (Vallacher & Wegner, 1989); second, when the necessary skills have already been acquired (Zimmermann & Kitsantas, 1997, 1999); third, if decision difficulty is the dependent variable (Thompson et al., 2009); finally, if self-regulatory resources have already been depleted (Agrawal & Wan, 2009). In contrast, a process focus may be adaptive in the following three conditions: First, if tasks are difficult (Vallacher et al., 1989); second, if skills have to be acquired for solving a task (Zimmermann & Kitsantas, 1997, 1999); finally, if affective feelings after failure feedback are assessed (Houser-Marko & Sheldon, 2008).

### The current work

Research examining the adaptive nature of process and outcome goal focus has yielded varying results. Thus, we aim to further investigate outcome and process goal focus. In experimental settings comprised of relatively easy tasks, prior research has shown that an outcome focus might be more adaptive. Alternatively, in the pursuit of everyday, difficult and long-term goals, which possess a higher risk of failure and, which are of higher personal relevance, a process focus might be a wiser choice. We investigate the effects of goal focus on different outcomes of self-regulation. We also test hypotheses concerning the mechanisms by which a process focus is more adaptive. In Part I and II of this thesis, we examine the adaptiveness of process and outcome focus for self-regulation whilst focusing on the consequences of process and outcome focus after the experience of failure.

*Part I: Changing eating behavior vs. losing weight: The role of goal focus for weight loss in overweight women.* In Part I, we investigate the role of goal focus for self-regulation in the context of a weight loss goal. In order to capture the complex behavior that the pursuit of a long-term goal such as losing weight encompasses and to achieve high ecological validity, a short-term longitudinal field study was conducted. We decided to investigate self-regulation in the context of the specific goal to lose weight because of the following reasons: First, it allows for a clear distinction and assessment of how intensely an individual thinks about the means of losing weight and the desired outcome, weight loss. Second, losing weight by means of dieting is a very common and health-relevant goal. This goal is difficult to achieve because it requires changing one's habits and regulating one's behavior, affect and thoughts to resist the temptation of immediate gratification in favor of future outcomes (Baumeister, Muraven, & Tice, 2000; Hofmann, Friese, & Roefs, 2009). We hypothesize that a focus on the immediate actions required to lose weight, such as, eating healthy food (process focus) is more adaptive than a focus on the short- and long-term consequences of weight loss, such as, an enhanced body shape (outcome focus). By focusing on the means of the diet the following should be fostered: Dieting

adherence and adaptive reactions to failure. The latter includes an increased compensation for lapses and a reduction in rumination about them. In contrast, focusing on the distant and yet desirable outcome of weight loss, lapses may tend to undermine a dieter's motivation, foster overeating and increase rumination about lapses. Altogether, we hypothesize that a process focus is negatively related to deviations from the diet, disinhibition after a lapse and rumination whilst concurrently fostering subjective well-being and successful weight loss.

*Part II: The adaptiveness of goal focus for subjective well-being and mastering success and failure.* In Part II, we elaborate the adaptiveness of process focus. We do this by reporting results on the role of goal focus in situations, in which people react to and identify failure (and success) during goal pursuit. As previously noted, research by Vallacher and Wegner (1989) has attested to the benefits of a process focus when people encounter difficulties during goal pursuit. Furthermore, Houser-Marko and Sheldon (2008) have shown that failure feedback impacts affect less negatively when it pertains to the process level, as opposed to the outcome level. However, not much is known about the underlying mechanisms. In order to shed light on the underlying mechanisms, we investigate how behavioral and affective reactions to failure, might be different in a process versus an outcome focus. We argue that a process focus is more beneficial after a setback as it fosters the substitution of means, rather than, the substitution of outcomes. In order to maintain subjective well-being, a process focus should also be more beneficial. This is the case because failing on the level of means to an end should not be viewed as as severe as failing on the level of the relatively more important ends.

Study 1 is a correlational online questionnaire study. We assess goal focus by asking participants, in general, how much they think about the means vs. the outcomes of two personal goals. We predict that the more they consider the means versus the outcomes, the more they will tend to substitute means after failure than to substitute the desired outcome. This substitution implies disengagement from the target outcome in favor of another. Furthermore, we predict that a relatively stronger process focus is indeed beneficial for subjective well-being. Study 2,



which is a field study pertaining to dieting was designed in order to test the abovementioned hypotheses. Specific means- and outcome-related attributions of failure are used as predictors of deviations from the diet, disinhibition after lapses (as an indicator of outcome substitution), weekly weight loss, and affective well-being during the diet. Additionally, the role of means- and outcome-related attributions of success is explored: Do these attributions also produce an impact on goal pursuit? Does the conclusion that outcomes have been successfully attained undermine future motivation, as opposed to the scenario in which the means of goal pursuit have instead been evaluated as appropriately implemented? We discuss how process-related attributions of failure and success may contribute to the relative adaptiveness of process focus.

In addition, the present thesis adopts a life-span developmental approach to the study of self-regulation. Prior research on goal focus or action identification has relied almost entirely on samples of younger adults. Accordingly, stating that people “naturally” show outcome-oriented thinking and embrace higher-level action identifications seems to be an overgeneralization. For example, the sample used in Vallacher and Wegner’s influential work on action identification (1989) consisted of  $n = 1100$  undergraduates,  $n = 110$  university faculty, staff and employees,  $n = 59$  research associates from a medical outpatient center and  $n = 125$  juvenile detainees. Other samples consisted of only students (e.g., Escalas & Luce, 2004; Wegner et al., 1984; Wegner & Vallacher, 1986). In our opinion, such a sampling bias towards the study of younger adults, results in an overgeneralization regarding what the “default” mode of thinking about actions (or goals) might be. In contrast, there are many reasons to argue for a shift from outcome to process goal focus across the adult life span (Freund et al., under review). Part III and IV of this thesis investigates this in detail and reports evidence for a shift from outcome to process focus in old age.

*Part III: On gains and losses, means and ends: Goal orientation and goal focus across adulthood.* Part III gives a comprehensive theoretical introduction to the hypothesized development of goal focus across adulthood. In Part III the scope of this investigation is broadened by including the

concept of goal focus into a larger developmental context. This in turn serves as the theoretical background of Part IV, whose function it to present our empirical results on goal focus across the life span.

First, we stress the importance of personal goals across the adult life span. We present the action-theoretical specification of the model of selective optimization with compensation (SOC model) which proposes that successful life-management can be achieved by the orchestration of three processes, namely the selection of goals, the optimization of the selected goals, and the compensation of goal-relevant means (e.g., Baltes & Baltes, 1990; Freund & Baltes, 1998). Using the SOC model as a framework, we address the adaptiveness of a shifting goal orientation from promoting gains to preventing and counteracting losses across adulthood (Ebner, Freund, & Baltes, 2006; Freund, 2006b). Next, we discuss our concept of goal focus; this involves delineating goal focus from related concepts, such as, mastery and performance orientation, and linking it to intrinsic and extrinsic motivation. An elaboration follows pertaining to how and why goal focus might evolve from outcome focus in young adulthood to process focus in later life. More specifically, we propose that restrictions in the availability of resources, a shortening of future life perspective and the increased importance of goals oriented towards achieving functional stability result in a process focus becoming more salient and adaptive in old age. Finally, we shall resume our argumentation for the general adaptiveness of a process focus after failure, since we view the ability to appropriately cope with failure as particularly important in old age.

*Part IV: Age-related differences in outcome and process goal focus.* In Part IV we present multi-method evidence for the hypothesized age-related shift from outcome to process focus. Study 1, which is a questionnaire study with younger and older adults demonstrates age-related differences in goal focus. Study 2 is a quasi-experiment that replicates age-related differences in goal focus and evidences differential emotional consequences of goal focus in younger and older adults. Finally, Study 3 is a short-term longitudinal field study in which research participants who

wanted to start and maintain a regular exercising regime indicated if their goal focus was either the means or desired outcomes. Other than portraying age-related differences in goal focus, Study 3 is linked with Parts I and II as it demonstrates the general adaptiveness of process focus regardless of age.

*Part V: Staying on and getting back on the wagon: Age-related improvement in self-regulation during a low-calorie diet.* Part V broadens the scope of this dissertation, which up to this point has examined goal focus; we now consider why self-regulation in the service of goal pursuit might actually improve across the adult life span. Part V investigates age-related differences in self-regulation during goal pursuit with a particular emphasis being placed on behavioral and cognitive reactions to failure. To reiterate, the dieting study (see Parts I and II) serves as a backdrop to this investigation regarding our hypothesized age-related improvement of self-regulation. Our fundamental argument is that because of practice effects in self-regulation and an increased motivation to counteract and cope with losses, the self-regulation of behavior, emotion, and cognition improves across the adult life span.

Finally, a comprehensive discussion of Parts I to V will be provided. The discussion intends to integrate the empirical evidence of all studies, deriving their theoretical and practical implications, and providing various suggestions for future research. This discussion will fixate on the mechanisms that drive the beneficial quality of process versus outcome focus, the determinants that restrict the adaptiveness of process versus outcome focus, the functionality of process versus outcome focus across the life span, the development of self-regulation across the life span, as well as its importance for developmental regulation.

Altogether, the thesis uses a variety of methods and investigates self-regulation in different settings in which people pursue personal goals. They will be introduced in more detail now.

**PART I: CHANGING EATING BEHAVIOR VS. LOSING WEIGHT: THE ROLE OF  
GOAL FOCUS FOR WEIGHT LOSS IN OVERWEIGHT WOMEN**

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**Abstract**

In a six-week longitudinal study with  $N = 126$  overweight women participating in a weight-loss program, we investigated whether focusing on the process (dietary behaviors) rather than on the outcome of dieting (weight loss) leads to more successful goal pursuit and achievement. As expected, a more dominant process focus was related positively to weight loss and negatively to self-regulation failure (i.e., deviations from the diet, rumination, disinhibition after lapses). Confirming our hypotheses, self-regulation failure was negatively related to affective well-being but, contrary to our hypotheses, goal focus was unrelated to well-being. Focusing more on the process than on the outcome may facilitate the achievement of difficult health-related goals and support self-regulation, but it does not contribute to affective well-being.

*Keywords:* Self-regulation, goal focus, means, outcomes, eating behavior, dieting

## Introduction

Changing one's eating behavior is challenging. Eating behavior is highly habitualized and triggered very frequently, namely, each time a person experiences hunger or appetite or is confronted with food-related stimuli. Not surprisingly, then, it is difficult for people to adhere to their diet when trying to lose weight. The benefits of goal setting, planning, and formulating implementation intentions have been investigated in various domains of health-related behavior including dieting (e.g., Achziger, Gollwitzer, & Sheeran, 2008). Nothing, however, is known about the role of *goal focus* in diet adherence, that is, whether people focus more on the means (i.e., the process) or the ends (i.e., the outcomes) when pursuing the goal of losing weight. The present study investigated the role of goal focus (i.e., focusing on the process vs. the outcome) for self-regulation and weight loss in overweight women participating in a diet program.

### **The difficulty of changing eating behavior**

Obesity is becoming an increasingly pressing health issue worldwide (Puska, Nishida, & Porter, 2003). According to the WHO (2006), one of the main reasons for overweight and obesity is the consumption of high-calorie and fast food. Changing one's eating behavior, however, is difficult for various reasons: First, eating behavior has a habitual nature. Habits are routine repetitions of behaviors cued by environmental stimuli rather than personal goals, intentions, or thoughts (Wood, Quinn, & Kashy, 2002). Habits, then, are under stimulus control and breaking automatic routines requires monitoring and self-regulation, both of which are effortful and demanding (Baumeister et al., 2000). Second, unlike other habits such as gambling, people have to eat and food-related cues that trigger eating habits cannot be avoided. Third, eating constitutes an immediate reward whereas weight loss and good health are more distant rewards. Effortful self-regulation is needed to resist the temptation of immediate gratification in favor of future outcomes (Baumeister et al., 2000; Mischel, Cantor, & Feldman, 1996). For these reasons many people have such a hard time to lose weight. We propose that whether people focus on the process or the outcome of their weight-loss goal might support self-regulation when

changing their eating behavior dieting and influence whether people succeed in losing weight .

### **Goal focus**

Goals can be defined as cognitive representations of personally desired (or dreaded) states to be approached (or avoided) through certain means (Kruglanski, 1996). People can focus more on the outcome of goal pursuit (short- and long-term consequences) or the process of goal pursuit (means of goal attainment). Following Sansone and Thoman (2005), “outcome focus” is defined as the motivation to engage in an activity because it leads to a certain end. In other words, the outcome of an activity is the focus of attention. In contrast, “process focus” refers to a higher salience of the means of goal pursuit.

Which goal focus is adaptive depends on the goal at hand. Zimmerman and Kitsantas (1997, 1999) found that, during task learning, a process focus helps people to acquire the necessary goal-relevant means. In contrast, an outcome focus seems to distract people from acquiring and practicing the goal-relevant means and to thereby hinder successful goal pursuit. An outcome focus may not be adaptive until different aspects of the goal-relevant means have been mastered and integrated into an action sequence so that they no longer require attention. Starting a new diet, then, should profit from a process focus. Accordingly, with respect to the goal to start exercising, Freund, Hennecke, and Riediger (2010) found that process focus was positively related to satisfaction with the goal, affective well-being, and greater persistence in goal pursuit. Regarding goal difficulty, Vallacher et al. (1989) showed that adopting a process focus resulted in better performance on difficult tasks and an outcome focus in better performance on easy tasks. As losing weight is a difficult task, a process focus should be more beneficial than an outcome focus.

Heckhausen’s model of action phases and the related model of cognitive mind-sets accompanying the different motivational phases (Gollwitzer, 1990; Heckhausen & Gollwitzer, 1987) propose that, during the actional phase of goal pursuit, a focus on the outcome on a rather abstract level of cognitive representation might be more dominant and adaptive. In contrast, we

assume that, especially after setbacks, it is most adaptive to re-evaluate the employed goal-relevant means by going back to an implemental mind-set and thinking about other paths that might help one to overcome the obstacle. Focusing on the outcome might distract a person from ways to implement goal-relevant means and thereby even hinder goal achievement. Particularly when long-term goals that require goal-relevant actions over an extended period of time are pursued, focusing on the means rather than the negative discrepancy between the actual and desired outcome should help sustain motivation even in the face of obstacles and setbacks (Kuhl & Beckmann, 1994). Thus, when weight loss is slow, focusing on the outcome (i.e., the desired weight) is more likely to discourage dieters than focusing on preparing certain foods.

### **Goal focus and the self-regulation of eating**

As mentioned above, losing weight implies changing one's eating habits, which, in turn, requires a high degree of self-regulation (Stroebe, 2008). Focusing on the process rather than the outcome of the goal might help dieters self-regulate in three ways.

First, adopting a process focus while dieting entails monitoring *what* one eats (rather than how much weight one has already lost), thereby making diet adherence more likely and *deviations* less likely.

Second, focusing on the means rather than the outcome of the goal to lose weight might guard against “what the hell” cognitions after lapses and subsequent *disinhibition* in eating (Cochran & Tesser, 1996; Polivy & Herman, 1985). “What the hell” cognitions and disinhibition typically occur when dieters feel that, after having violated dietary restrictions, they can go ahead and eat even more because their calorie allowance for that day has been exceeded anyway. If people are highly outcome-focused, lapses are likely to be represented as a failure to move toward the desired outcome, which, in turn, might undermine people's motivation to continue pursuing the difficult goal. Instead, if dieters focus on each meal as a step towards their goal, transgressing once might result in their adhering to the diet at the next meal instead of interpreting one lapse as a failure to achieve one's goal for an entire day.



Third, a stronger process focus might also guard against rumination after diet setbacks. During a diet, weight loss does not occur daily and might fluctuate somewhat even if one adheres to the diet. Focusing on the outcome of dieting might make it more likely for dieters to compare the actual with the desired state and consequently more prone to rumination about stagnation or setbacks in weight loss. Rumination, that is, the tendency to think about the causes and consequences of problems rather than the means to solve them, is associated with less positive expectations of achieving one's goal, less effective solutions to one's problems (Lyubomirsky & Nolen-Hoeksema, 1995), and more negative, global self-evaluations that undermine perceived competence (Rimes & Watkins, 2005). This, in turn, should jeopardize the successful pursuit of a difficult goal such as dieting.

In sum, the goal of losing weight should profit from a more dominant process focus. Our main hypothesis is that a stronger process than outcome focus contributes to weight loss in dieters. Moreover, we hypothesize that a stronger process focus is related to fewer failures in self-regulation. Specifically, we assume that process focus is negatively related to deviations from the diet, disinhibition, and rumination. Moreover, we expect failures in self-regulation to be negatively related to weight loss and have a negative impact on dieters' affective well-being. These hypotheses were addressed in a short-term longitudinal study of overweight women with a mutual goal: to lose weight.

Goal-setting theory proposes that difficult goals might be achieved more easily when the goals are more concrete (e.g., Locke & Latham, 2002). As means are typically more concrete than outcomes (Carver & Scheier, 1995; Vallacher & Wegner, 1985), we also tested the impact of subjective concreteness of the process and outcomes of the dieting goal.

## **Methods**

### **Participants**

The study targeted overweight and obese women who wanted to lose weight and would agree to participate in a 6-week diet program. Participants were recruited through advertisements

in local newspapers. In short phone interviews prior to the study, women were asked to report their weight and height in order to ensure that they were actually overweight, which was defined as a body mass index (BMI; kg/m<sup>2</sup>) of over 25 following World Health Organization guidelines. The sample of women fulfilling this criterion consisted of  $N = 126$  women between 19 and 77 years of age ( $M = 47.2$ ,  $SD = 15.9$ ) with an initial BMI of 25 to 46 ( $M = 31.6$ ,  $SD = 5.0$ ). They reported having been overweight for 1 to 43 years ( $M = 13.8$ ,  $SD = 9.3$ ) and wanting to lose at least 4.4 lbs ( $M = 27.0$ ,  $SD = 18.3$ ) over the course of six weeks. 39% of the sample had finished high school (*Gymnasium*); 52% had finished an apprenticeship.

### **Procedure**

The study consisted of seven measurement occasions over 7.5 weeks. T1 (two to five days before the diet began) and T7 (1 week after the diet ended) were group sessions held in our laboratory at which questionnaires were filled out, the diet explained (T1), and the participants' weight and height measured. Participants were instructed to start the diet on the Monday following T1. All agreed to adhere to the diet for at least six weeks. In addition, every Saturday during the six-week dieting phase participants filled out weekly online questionnaires reporting their dieting behavior and affective well-being. The questionnaires were administered via the PHPSurveyor tool for online surveys (now: [www.limesurvey.org](http://www.limesurvey.org)). Participants received weekly reminder e-mails with a link to the questionnaire.

T1 was held in groups of 2 to 25 women; participants filled out a questionnaire and then received instructions. In the instruction part, participants were introduced to the diet ("Brigitte Diet") and, as an incentive to participate in the study, received a free copy of a book with a detailed explanation of the diet and recipes. The Brigitte Diet was chosen because an independent German consumers' organization recommended it as a healthy balanced diet with a high probability of successful weight loss. Participants received 70 Swiss francs (approx. \$60) for completing T1 to T7.

## Weekly Measures

Each week, participants filled out a web-based questionnaire. For the present set of analyses, we used the following measures (the means and *SDs* given are aggregated across all measurement occasions):

*Goal focus.* Participants indicated on two newly developed items how much they focused on the process and the outcomes of dieting, respectively (“*During the past week, how much did you think about what you have to do to eat low-calorie and low-fat food?*” [process focus] “*..., about what weighing less would be like?*” [outcome focus]). Goal focus, defined as a stronger focus on the process or the outcome, was indexed by a relative score subtracting outcome focus from process focus ratings. Positive values indicate a process focus, negative values an outcome focus. Scores ranged from –6 to 6 ( $M = .21$ ,  $SD = 1.20$ ).

*Concreteness of process versus outcome.* Participants indicated how concrete they perceived the process and outcomes of dieting on two items each (process concreteness: “*During the past week, how concrete was your idea about what it means to eat according to the diet?*” outcome concreteness: “*... the way you would look like after the diet?*”). In keeping with the definition of goal focus, we again computed a relative score of concreteness by subtracting outcome concreteness from process concreteness ratings. Positive values indicate greater process concreteness, negative values greater outcome concreteness. Concreteness ranged from –3 to 6 ( $M = .56$ ,  $SD = 1.45$ ). Theoretically, goal focus and concreteness are related (e.g., Carver & Scheier, 1995; Vallacher & Wegner, 1985), but not redundant (Freund et al., 2010). To test whether our measures of goal focus and concreteness were also empirically distinct, we computed the correlation between the two. Aggregated across measurement occasions, the correlation was  $r = .23$  ( $p = .01$ ), converging with expectations of a moderate association between the two constructs.

*Affective well-being.* A 12-item short version of the multidimensional mood questionnaire (Steyer, Schwenkmezger, Notz, & Eid, 1997) was used to assess weekly affective well-being. The scale measures affective states on the dimensions mood, arousal, and vigilance. For each

measurement occasion, we computed two separate aggregate scores encompassing the positive or the negative affect items, respectively (positive affect: all Cronbach's alphas  $> .74$ ;  $M = 4.22$ ,  $SD = 1.17$ , negative affect: all Cronbach's alphas  $> .86$ ;  $M = 1.41$ ,  $SD = 1.28$ ).

*Self-regulation failure.* We included three indicators of self-regulation failure:

*Deviations from the diet.* Deviations were assessed using the single item "*How much did you deviate from the dietary requirements during the past week?*" ( $M = 2.28$ ,  $SD = 1.73$ ).

*Rumination after failure.* Diet-related rumination after failure was assessed using a self-developed 6-item questionnaire (following Kuhl, 1990, see Appendix A). We calculated an average score over the six items, with higher scores indicating a stronger tendency to ruminate about deviations from the diet requirements (e.g., "*Whenever I violated the diet requirements, it took me a long time to accept it.*" all Cronbach's alphas  $> .68$ ;  $M = 2.58$ ,  $SD = 1.26$ ).

*Disinhibition after failure.* Disinhibition was assessed using the mean across six bipolar items that contrasted disinhibition with compensation for lapses (e.g., "*Whenever I could not resist a temptation, I stopped dieting for that day.*", see Appendix B). Higher scores indicate a tendency to show disinhibited eating after dieting lapses; lower scores indicate compensation (all Cronbach's alphas  $> .64$ ;  $M = 2.66$ ,  $SD = 1.29$ ).

*Weight loss.* Weight was measured before and after the diet by assistants using a scale in our laboratory. Participants lost  $M = 6.47$  lbs ( $SD = 5.5$ ; range:  $-5.17$  and  $20.9$ ) over the course of the six-week diet.

## Statistical analyses

Except for weight loss, constructs were assessed weekly. As measurement occasions (level 1) were nested within persons (level 2), multilevel regression analyses were applied (with SPSS.16). Restricted maximum likelihood parameter estimates were obtained by fitting multilevel regression models with first-order autoregressive residual covariance structures. The interpretation of the multilevel fixed effects is equivalent to that of parameter estimates in OLS regression. Multilevel models included only the estimation of fixed effects. All predictors were

grand-mean centered prior to analyses. To analyze the effects of goal focus and process versus outcome concreteness on weight loss and life satisfaction, ordinary linear regression analyses were conducted.

## Results

### Goal focus and weight loss

The first step of a hierarchical regression analysis with goal focus and process versus outcome concreteness as predictors showed that a more dominant process focus was significantly related to weight loss ( $\beta = .23, p = .03$ ) whereas process versus outcome concreteness was not ( $\beta = .10, p = .38; R^2$  for step 1 = .08,  $p = .03$ ). Including the interaction between goal focus and concreteness in a second step ( $\beta = -.09, p = .44$ ) did not significantly improve the prediction of weight loss ( $\Delta R^2 = .01, \Delta F = .60, p = .44$ ), nor did it reduce the association between goal focus and weight loss.

### Goal focus and indicators of self-regulation failure

Table 1 summarizes the results of multilevel analyses of the predictive power of goal focus with respect to indicators of self-regulation failure. A more dominant process focus was related negatively to deviations from the diet, (marginally) to disinhibition after dieting lapses, and to rumination. In contrast, concreteness was unrelated to all of these indicators of self-regulation failure. On an exploratory level, we also tested for possible interaction effects of goal focus and concreteness. None of the interaction effects were significant (all  $t < |1.33|$ , all  $p > .17$ ).

### Goal focus and indicators of affective well-being

Goal focus did not predict positive or negative affect significantly (see Table 2). Including the interaction of goal focus and concreteness in an additional set of analyses did not yield significant results (all  $t < |0.30|$ , all  $p > .75$ ).

Table 1: Selected results from multilevel regression models: Estimates of fixed effects predicting deviations from diet, disinhibition, and rumination ( $N = 126$ , max. six assessments)

Parameter	Deviations			Disinhibition			Rumination		
	<i>Estimate</i>	<i>t</i>	<i>p</i>	<i>Estimate</i>	<i>t</i>	<i>p</i>	<i>Estimate</i>	<i>t</i>	<i>p</i>
	(SE)	(approx df)		(SE)	(approx df)		(SE)	(approx df)	
Intercept	2.26 (.10)	22.12 (161)	< .001	2.68 (.08)	34.56 (157)	< .001	2.62 (.09)	29.75 (135)	< .001
Goal focus <sup>a</sup>	<b>-.12</b> (.06)	<b>-2.18</b> (576)	<b>.03</b>	<b>-.07</b> (.04)	<b>-1.72</b> (568)	<b>.09</b>	<b>-.10</b> (.03)	<b>-3.25</b> (506)	<b>.001</b>
Process vs. outcome concreteness	-.03 (.05)	-.60 (574)	.55	-.02 (.04)	-.60 (583)	.552	-.03 (.03)	-1.00 (568)	.32

*Note.* Bold values represent significant parameter estimates that are in line with the hypotheses. The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Goal focus} + \gamma_{02}\text{Process vs. outcome concreteness}_{ij} + \mu_{0j}$ .

<sup>a</sup> Higher values indicate a more dominant process focus.

## Self-regulation failure

Do the indicators of self-regulation failure contribute to weight loss? As expected, all three self-regulation failure constructs evinced significant negative correlations with weight loss:  $r = -.50, p < .001$  for deviations from the diet;  $r = -.37, p < .001$  for disinhibition after lapses;  $r = -.35, p = .001$  for rumination. A linear regression analysis was used to estimate the relative impact of each of three indicators of self-regulation failure (all centered, aggregated across measurement points) on actual weight loss. Only deviations from the diet emerged as a significant predictor of weight loss ( $\beta = -.41, p < .001$ ; rumination  $\beta = -.16, p = .18$ ; disinhibition  $\beta = -.05, p = .72$ ; overall model:  $R^2 = .28, F(3, 86) = 11.12, p < .001$ ).

We then explored whether the relationship between goal focus and weight loss was mediated by self-regulation failure following Baron and Kenny (1986). The first step, the significant association between goal focus and weight loss, was established (see above). In the second step, we conducted correlations between goal focus and the aggregated self-regulation

Table 2: Selected results from multilevel regression models: Estimates of fixed effects predicting positive and negative affect ( $N = 126$ , max. six assessments)

Parameter	Positive affect <sup>b</sup>			Negative affect <sup>c</sup>		
	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>
Intercept	4.19 (.06)	71.03 (170)	< .001	1.43 (.07)	21.79 (165)	< .001
Goal focus <sup>a</sup>	.02 (.04)	.64 (592)	.52	-.02 (.04)	-.48 (592)	.63
Process vs. outcome concreteness	.02 (.03)	.66 (506)	.51	-.02 (.04)	-.352 (507)	.73

*Note.* The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Goal focus} + \gamma_{02}\text{Process vs. outcome concreteness}_{ij} + u_{0j}$ .

<sup>a</sup> Higher values indicate a more dominant process focus.

<sup>b</sup> Results after controlling for baseline positive affect ( $Estimate = .35$ ,  $SE = .05$ ,  $t(170) = 71.03$ ,  $p < .001$ ).

<sup>c</sup> Results after controlling for baseline negative affect ( $Estimate = .29$ ,  $SE = .05$ ,  $t(162) = 5.68$ ,  $p < .001$ ).

failure variables. Here, only the relationship between goal focus and disinhibition was significant ( $r = .19$ ,  $p = .04$ ). Finally, we conducted a regression analysis entering goal focus in the first step and disinhibition in the second. Results do not suggest mediation as the prediction of weight loss by a more dominant process than outcome focus ( $\beta = .26$ ,  $p = .01$ ) was not affected by the inclusion of disinhibition in the prediction ( $\beta = .22$ ,  $p = .03$ ). Together, goal focus and disinhibition predicted 18% of the variance in actual weight loss ( $F(2, 87) = 9.66$ ,  $p < .001$ ; disinhibition:  $\beta = -.34$ ,  $p = .001$ ).

To test the predicted associations between the three indicators of self-regulation failure and affective well-being, another set of multilevel regression analyses were conducted (see Table 3). As expected, deviating from the diet, disinhibition, and rumination after lapses were all significantly associated with lower positive affect and higher negative affect. When entered simultaneously, disinhibition and rumination, but not deviations from the diet, predicted positive and negative affect.

Table 3: Selected results from multilevel regression models: Estimates of fixed effects predicting positive and negative affect ( $N = 126$ , max. six assessments)

Parameter	Positive affect <sup>a</sup>			Negative affect <sup>b</sup>		
	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>
Intercept	4.20 (.06)	75.35 (174)	< .001	1.43 (.06)	22.48 (172)	< .000
Deviations	-.03 (.03)	-.96 (583)	.337	.03 (.03)	.99 (586)	.322
Disinhibition	<b>-.09</b> (.04)	<b>-2.12</b> (590)	<b>.034</b>	<b>.08</b> (.04)	<b>1.71</b> (591)	<b>.089</b>
Rumination	<b>-.14</b> (.04)	<b>-3.11</b> (467)	<b>.002</b>	<b>.10</b> (.05)	<b>4.87</b> (172)	<b>.038</b>

*Note.* Bold values represent significant parameter estimates that are in line with the hypotheses. The full model included two levels, namely assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Deviations}_{ij} + \gamma_{02}\text{Disinhibition}_{ij} + \gamma_{03}\text{Rumination}_{ij} + u_{0j}$ .

<sup>a</sup> Results after controlling for baseline positive affect ( $\text{Estimate} = .29$ ,  $SE = .05$ ,  $t(177) = 5.69$ ,  $p < .001$ ).

<sup>b</sup> Results after controlling for baseline negative affect ( $\text{Estimate} = .25$ ,  $SE = .05$ ,  $t(172) = 4.87$ ,  $p < .001$ ).

## Discussion

Anyone who has ever tried to change a habit, such as eating behavior, knows how difficult it is. The present study suggests that focusing on the process instead of the desired outcome of behavior change might contribute to the successful pursuit of difficult goals. More specifically, focusing on the process of dieting (the eating behavior) instead of its outcome (the weight loss) was related to actual weight loss. Moreover, process focus was negatively related to indicators of self-regulation failure, arguably one of the key factors for maintaining a behavioral change over time (Baumeister & Heatherton, 1996). Importantly, the adaptiveness of a more dominant process focus for self-regulation during the diet and actual weight loss cannot be attributed to greater concreteness of the process focus. Having a more concrete representation of the process, as compared to the outcome, of dieting was not related to weight loss or to indicators of self-regulation. Moreover, controlling for concreteness did not affect any of the results.



This study also shows that self-regulation failure influences positive and negative affect much more than goal focus does. In fact, contrary to our hypotheses, goal focus was unrelated to measures of affective well-being, so it might be more strongly related to motivation than to affect. Goal focus was only indirectly associated with affective well-being through self-regulation. Failing to regulate one's behaviors and thoughts (such as deviating from one's diet, engaging in disinhibited eating after a lapse, ruminating about transgressions) is experienced directly and is thus more likely to affect one's well-being than the salience of the means or the outcome of a goal. Using a different operationalization of goal focus as the outcome- or means-related motive to exercise regularly, however, Freund et al. (2010) found that process focus was related to higher levels of affective well-being. The cognitive operationalization of goal focus as the salience of means and outcomes in the representation of the goal to lose weight in the present study might have missed out on the more emotional aspects of goal focus. Future studies need to investigate which aspects of goal focus drive self-regulation and which are related to affective well-being.

### **Limitations**

In the present study, goal focus was assessed rather than experimentally induced. Thus, we did not test whether people who adopt a stronger process focus differ in other variables that influence self-regulation and weight loss. Although we ruled out goal concreteness as a plausible third variable, there are other possible candidates such as time perspective. When thinking about near-future events, people might also represent their goals in terms of the means rather than the outcome (Trope & Liberman, 2003). In fact, we assume that a shorter time perspective is related to a stronger process focus (Freund et al., 2010). The present study did not include a measure of time perspective and cannot disentangle the effects of the two.

Another limitation concerns the sample, which consisted of overweight women who all shared the goal of losing weight. Further studies should test whether results generalize to other samples as well as other target behaviors requiring self-regulation. Note, however, that Freund et al. (2010) showed that adopting a process focus also helps one to start exercising regularly.

Moreover, studies by Zimmerman and Kitsantas (1997, 1999) support the notion that a process focus is advantageous when learning how to throw darts or writing revisions.

## **Conclusion**

The present study contributes to growing evidence that self-regulation is one of the central psychological constructs for understanding complex behaviors that need to be monitored over longer periods of time (Baumeister & Heatherton, 1996; Stroebe, 2008). To our knowledge, this is the first study to show that representing the targeted goal primarily in terms of the process or the outcome, respectively, is a significant predictor of self-regulation.

This result has important implications for clinical and other applications targeting behavioral change. Besides increasing goal concreteness, providing information about the means of goal pursuit, and helping people form implementation intentions (e.g., Achtziger et al., 2008; Gollwitzer, 1990), it seems advisable to focus people's attention on the means instead of the outcome of their goal in order to support their self-regulation.

**PART II: THE ADAPTIVENESS OF GOAL FOCUS FOR SUBJECTIVE WELL-  
BEING AND MASTERING SUCCESS AND FAILURE**

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### **Abstract**

Two studies showed that goal focus (i.e., focusing on the process as opposed to the outcome of goal pursuit) is related to subjective well-being and behavioral and affective reactions to failure. As expected, Study 1 showed in a sample of  $N = 129$  participants that a more dominant process focus was positively associated with affective well-being and the substitution of means after failure. In Study 2,  $N = 126$  women pursuing the goal to lose weight, filled out weekly questionnaires on their goal focus, subjective well-being, and reactions to dieting failures. Again in support of our hypotheses, multilevel analyses revealed that primarily attributing dieting failure as well as success to the means (i.e., adopting a process focus) had positive affective consequences and was associated with less disinhibited eating and more actual weight loss. The general adaptiveness of focusing on the process or the outcome while pursuing personal goals is discussed.

*Keywords:* Goal focus, attributions, failure, weight loss, dieting

## Introduction

The saying “The path is the goal” places higher value on the means of goal pursuit than the desired outcome. In contrast, “The end justifies the means” prioritizes the outcomes over the means. What are the consequences of focusing on the means versus the outcome of goal pursuit for affective well-being and goal achievement? Two studies investigated this question. Study 1 tested the hypothesis that adopting a primarily process focus has generally positive affective consequences and, when one experiences failure during goal pursuit, fosters one’s intention to substitute the means of goal pursuit but stick to the same outcome. The aim of Study 2 was to replicate and extend Study 1 by also including the affective and behavioral consequences of attributing success to the process versus the outcomes of goal pursuit.

### Goal focus

Goals can be defined as subjectively desirable states that the individual intends to attain through action (Kruglanski, 1996). Research on personal goals has demonstrated that goals can differ on various dimensions including content, difficulty, concreteness, or orientation towards gains or losses (e.g., Austin & Vancouver, 1996; Freund & Ebner, 2005; Little, 1989; Locke & Latham, 2002; Wiese & Freund, 2005). One aspect of goals that has largely been neglected is goal focus. Goal focus refers to the fact that goals can be represented primarily in terms of the means or the outcomes (Sansone & Thoman, 2005; Vallacher & Wegner, 1987, 1989; Zimmerman & Kitsantas, 1997, 1999). As noted by Kruglanski (1996), the cognitive representation of goals comprises the relation of means (process) and ends (outcome; see also Kruglanski et al., 2002). The relative salience of means and ends, however, can differ for different goals and different people (Freund et al., 2010). Our definition of goal focus is based on the *relative* salience, that is, the salience of the means of goal pursuit (process focus) compared to the salience of the desired end states (outcome focus; Freund et al., 2010).

To date, only few studies have investigated the adaptiveness of the process and outcome focus. Taken together, this research suggests that a process focus might be more adaptive. For

instance, Freund et al., (2010) found that focusing on the means rather than the outcome of goal pursuit was positively related to subjective well-being, to positive subjective evaluations of goal progress, attainability, involvement, and satisfaction, as well as to higher persistence in goal pursuit in exercise beginners. Vallacher et al. (1989) showed that a focus on the means resulted in better performance if the given task was difficult, whereas a focus on the outcome resulted in better performance if the task was easy. In a field experiment, Pham and Taylor (1999) demonstrated that students performed better on their exams after visualizing themselves studying, a process-related mental simulation, than after visualizing themselves getting a high grade, an outcome-related mental simulation. They did best, however, after combining the two. Zimmerman and Kitsantas (1997, 1999) showed that, during the acquisition of complex skills like throwing darts or revising self-written texts, process goals (here, trying to do certain steps of a given technique correctly) result in better performance than outcome goals (here, trying to achieve good results).

What are the *mechanisms* underlying the adaptiveness of process focus? One of the reasons why process focus is related to better affective well-being and persistence in goal pursuit might be that focusing on the process towards rather than the achievement of a certain outcome offers more potential for positive feedback (Freund et al., 2010). As research on the “hedonic treadmill” shows (for a review, see Frederick & Loewenstein, 1999), achieving desired outcomes typically increases happiness only for relatively short periods of time. Because the process of goal pursuit is temporally more extended than the actual attainment of a goal, focusing on the outcome throughout goal pursuit draws one’s attention to the negative discrepancy between the actual and the desired state, which might lead to negative affect, especially if goal progress is slow or when one experiences setbacks or failures (Carver & Scheier, 1981). Furthermore, focusing on *how* to pursue a goal instead of *why* one pursues it, might also be the basis for exhibiting action planning of when, where and how to act in service of the goal at hand (Gollwitzer, 1999; Sniehotka, Scholz, & Schwarzer, 2005), action control, including the monitoring of one's behavior

(Sniehotta et al., 2005), or planning how to overcome possible obstacles during goal pursuit (Sniehotta, Schwarzer, Scholz, & Schüz, 2005).

### **Goal-focus-related attributions of failure**

Unfortunately, people do not always succeed when pursuing their goals but often experience setbacks and failures: Some dieters lose less weight than expected, students might fail an exam, and scientists sometimes conduct studies that do not lead to the predicted results. Such failures and setbacks in goal pursuit are major threats to future persistence and subjective well-being (Carver & Scheier, 1990; Pomerantz, Saxon, & Oishi, 2000). Consequently, much attention has been given to identifying the psychological factors that might positively influence behavioral, cognitive, and affective reactions to failure. For example, a substantial number of studies have demonstrated the role of causal attributions in explaining how people experience and react to failure (e.g., Abramson, Seligman, & Taesdale, 1978; Weiner, 1985). We propose that goal-focus-related attributions might also have an impact on people's ability to cope with setbacks and failure in goal pursuit. We will elaborate on this aspect in more detail below.

When people pursue goals, feedback about goal progress is essential for deciding whether corrections are necessary or if the person should continue to use the same means (Locke & Latham, 1990) or if the goal should be abandoned altogether. According to Carver and Scheier (1990), feedback about the velocity with which the discrepancy between the actual and the desired state is reduced is essential in this regard. Such feedback might sometimes refer explicitly to the process or the outcome (Earley, Northcraft, Lee, & Lituchy, 1990), but might more often be ambiguous as to whether it implicates the means or the outcome. Lack of progress could be due to inadequate means or to having chosen a goal that cannot be achieved with the given means. For instance, if I do not succeed in becoming the world's highest ranked tennis player, it could be due to an inadequate training regime or to the fact that I am simply not talented enough – whatever the training regime – to achieve this goal. Thus, not advancing in the ranking, the lack of success could be located either on the level of means or on the level of the outcome.

What determines whether failures are located on the level of the means or the outcome?

We posit that one of the determinants is the initial goal focus. Focusing on the means during goal pursuit should render the means cognitively more accessible, whereas focusing on the outcome should be associated with greater cognitive accessibility of the outcome. As highly accessible constructs influence information processing (e.g., Bargh & Pratto, 1986; Förster, Liberman, & Higgins, 2005; Higgins, 1996), information about (the lack of) progress in goal pursuit should be processed in terms of the means or the outcome, respectively, depending upon the initial goal focus. Localization of failure, then, is expected to correspond to the goal focus a person adopted during goal pursuit. Success (and failure) should be identified as “*The means did not work*” in a process focus (process-related attribution) and as “*The goal is not attainable*” in an outcome focus (outcome-related attribution).

### **Behavioral consequences**

In general, we hypothesize that process-related attributions lead to behavioral reactions that revolve around the process, whereas outcome-related attributions lead to behavioral reactions that revolve around the outcome. Focusing on the means and attributing failure to the means should increase the likelihood of a *substitution of means*, whereas focusing on the outcome and attributing failure to the desired outcome should increase the likelihood of a *substitution of the outcome* (i.e., a goal switch). The rationale for these hypotheses is straightforward: If the means are cognitively accessible and the reason for failure is attributed to the means, one might assume that other means might be more successful in bringing about the desired outcome. If, however, the outcome is cognitively accessible and the target outcome is believed to be unattainable, simply switching to other means would not be considered sufficient, so the abandonment of an unattainable in favor of a more attainable outcome is more likely.

### **Affective consequences**

As argued above, we assume that, in general, outcome focus is likely to be detrimental to subjective well-being. The reason for this assumption is that an outcome focus implies focusing



on the negative discrepancy between the actual and the desired state, stressing what one has not (yet) achieved (Freund et al., 2010). In this sense, an outcome focus makes salient the deficiency of the current state vis-à-vis the desired outcome. This should result in a higher likelihood of experiencing negative affect than when one focuses on the process of goal pursuit. Focusing on the process during goal pursuit can offer numerous opportunities for positive rewards as each step forward is viewed as progress. This hypothesis is consistent with Emmons (1992) who demonstrated that high-level strivers who pursue abstract goals experience more depression than low-level strivers who pursue concrete goals.

Moreover, we hypothesize that when evaluating one's progress towards a goal, attributing failure to the means is less threatening and will elicit less negative emotions than attributing failure to the outcome. This hypothesis is empirically supported by research by Houser-Marko and Sheldon (2008). Their study showed that failure feedback has stronger negative effects on mood and expectancy when it pertains to the outcome (which they termed "primary goal level") as compared to the process (which they termed "sub-goal level"). This can be explained by referring to the hierarchical organization of goals and their subordinate means (e.g., Carver & Scheier, 1982, 1990; Vallacher & Wegner, 1987): The higher a goal is placed in a personal goal hierarchy, the more important it is (Austin & Vancouver, 1996). Thus, by definition, an outcome should carry more personal importance than its means and, accordingly, a threat to the outcome should be more severe than one to the means.

In addition to these direct effects of goal focus and negative feedback on affect, an indirect effect might occur as a consequence of the behavioral outcomes of goal focus. Specifically, behavioral reactions should partly mediate the effects of goal focus and goal-focus-related attributions on well-being. Disengaging from the target outcome (i.e., outcome substitution) should have higher costs for subjective well-being than disengaging from a more subordinate means in favor of another (i.e., means substitution).

## **The current research**

Study 1 was an internet-based self-report study that investigated whether goal focus is associated with behavioral reactions to failure (means substitution vs. outcome substitution) and subjective well-being. More specifically, Study 1 investigated the following hypotheses: (H1) A stronger process focus (i.e., stronger process than outcome focus) should be positively related to (a) affective well-being and (b) the intention to substitute means instead of outcomes after failure. (H2) The intention to substitute means should partly mediate the positive relationship between process focus and well-being.

Study 2, a 6-week longitudinal study, applied the central hypotheses more specifically to attributions of failure while one is pursuing the goal to lose weight by dieting. This study explored the role of success attributions and examined the effects of process- and outcome-related attributions on affective well-being and behavioral reactions to failure. Weight loss was assessed on a weekly basis as an indicator of actual success in goal pursuit. We will elaborate on Study 2 below.

### **Study 1**

Study 1 investigated whether a stronger focus on the process than on the outcome of a goal is positively related to a higher level of affective well-being and the intention to substitute means (as compared to outcomes) when one encounters failure. It also tests the assumption that the substitution of means partly mediates the positive relationship between process focus and affective well-being. This should be the case because disengaging from means is typically easier than disengaging from outcomes (Vallacher & Wegner, 1987, 1989).

### **Method**

*Participants.* Participants were recruited via advertisement on Swiss, German, and Austrian websites. The questionnaire was presented using the PHPSurveyor tool for online surveys (now: [www.limesurvey.org](http://www.limesurvey.org)).  $N = 129$  participants (20-80 years,  $M = 36.2$ ,  $SD = 16.0$ , 74% female) filled out the online questionnaire. 69% had completed the highest school track in their home country.

As a token of our appreciation for their participation, we raffled off 10 movie theater gift certificates (worth about \$15 each) among the participants.

**Measures.** Unless otherwise noted, items were rated on 7-point scales ranging from 0 (not at all) to 6 (very much).

*Goal focus.* To operationalize the relative salience of the process as compared to the outcome of goal pursuit, participants were asked to name two personal goals they wanted to pursue in the near future. All goal-related measures were averaged over the two goals. To indicate *outcome focus*, participants rated how much they thought about and how concrete their idea was of “*what it will be like to attain that goal*” ( $M = 4.16, SD = 1.00$ ). To indicate *process focus*, they rated how much they thought about and how concrete their idea was of “*what they can do to pursue the goal*” ( $M = 4.53, SD = .87$ ). A difference score subtracting participants’ scores in outcome focus from their score in process focus served as an index for the *relative process focus* (*range*:  $-1.75$ - $3.25$ ,  $M = .37, SD = .88$ ).

*Self-reported behavioral reactions to failure.* We developed a 5-item questionnaire to assess how people react to failure in the pursuit of their personal goals. The five items (see Appendix C) had a forced-choice format, consisting of two statements about possible responses to failure in the pursuit of a goal, one reflecting the strategy of outcome substitution, the other reflecting the strategy of means substitution. Each item contrasted the two strategies as alternative responses to failure. Responses signaling outcome substitution were taken from the SOC questionnaire by Baltes, Baltes, Freund, and Lang (1999; for more detailed information on the assessment of loss-based selection, see also Freund & Baltes, 2002). The *relative* number of means substitution choices served as the dependent variable ( $M = .83, SD = .22$ , Cronbach’s alpha = .78).

*Subjective well-being.* The *affective* component of subjective well-being was assessed with the 12-item short version of the Multidimensional Mood Questionnaire (Steyer et al., 1997). A single aggregate score for positive affect over the previous six months was computed ( $M = 3.66, SD = 1.05$ , Cronbach’s alpha = .91). The Satisfaction With Life Scale by Diener, Emmons, Larsen, and

Griffin (1985) measured the *cognitive-evaluative* component of well-being ( $M = 3.93$ ,  $SD = 1.19$ , Cronbach's  $\alpha = .87$ ).

*Goal importance.* To control whether goal importance might interact with goal focus in the prediction of subjective well-being or self-reported behavioral reactions to failure, participants also indicated how important the two goals were to them. We calculated an average goal importance score across the two goals ( $M = 5.20$ ,  $SD = .84$ ). As including the interaction of relative process focus by goal importance into the regression analyses did not contribute to either the prediction of behavioral reactions to failure or subjective well-being and did not change the pattern of results, we report results from regression analyses without the inclusion of goal importance.

## Results

*Goal focus and subjective well-being.* Supporting hypothesis H1(a), regression analyses revealed that relative process focus significantly predicted positive affect ( $\beta = .32$ ,  $p < .001$ ,  $R^2 = .10$ ) and life satisfaction ( $\beta = .17$ ,  $p = .05$ ,  $R^2 = .03$ ).

*Goal focus and behavioral reactions to failure.* Supporting hypothesis H1(b), relative process focus significantly predicted the participants' intention to substitute means rather than outcomes after failure ( $\beta = .27$ ,  $p = .002$ ,  $R^2 = .07$ ).

*Mediation of the effects of goal focus on subjective well-being by means substitution after failure.* It was hypothesized (H2) that the effect of process focus on affect and life satisfaction is partly mediated by the behavioral reaction. We were able to test this as both preconditions specified by Baron and Kenny (1986) were met: There was a significant relationship between predictor (relative process focus) and criteria (positive affect, life satisfaction) as well as between predictor and potential mediator (means substitution). Another reason why we were able to test for a mediation effect was because the intention to substitute means, the mediator, was significantly correlated with the criteria positive affect ( $r = .23$ ,  $p = .007$ ) and life satisfaction ( $r = .24$ ,  $p = .007$ ). To test for mediation of the effects of process and outcome focus on positive affect and

life satisfaction by means substitution, we included means substitution in a second step in the regression analyses as a further predictor. For positive affect as a criterion, the regression weights of relative process focus were very similar to those obtained in the previous analysis without the predicted mediator ( $\beta = .28, p = .002, R^2$  in step 2 = .13). Accordingly, the results do not suggest the presence of a mediation effect. For life satisfaction, the regression weight of relative process focus became smaller ( $\beta = .12, p = .19, R^2$  in step 2 = .07). However, the Sobel test did not quite reach statistical significance ( $z = 1.74, p = .08$ ) (Baron & Kenny's procedure, 1986; the Sobel test was conducted on the website <http://www.people.ku.edu/~preacher/sobel/sobel.htm>). Means substitution, then, showed only a trend to carry the effects of process focus on life satisfaction. Hence, the effect of process focus on both indicators of affective well-being was largely independent of the effect of means substitution on affective well-being.

### **Brief discussion**

Study 1 tested whether goal focus is related to subjective well-being and to self-reported behavioral reactions to failure. Replicating previous research (e.g., Freund et al., 2010), a relative focus on the process was positively related to positive affect and life satisfaction. As a consequence, we can assume a generally positive relation between process focus and subjective well-being. Although having important goals is typically related to subjective well-being as these goals provide direction and meaning to people's lives (e.g., Emmons, 1989; Little, 1989), focusing on the desired outcome does not seem to increase positive affect or life satisfaction. In contrast, we found focusing on the means of goal pursuit to be related to higher subjective well-being.

As expected, a relative process focus was also associated with substituting the means related to a goal rather than switching to an entirely different goal (outcome substitution). Accordingly, focusing on the means might not lead to higher commitment to a specific way of pursuing one's goals but instead seems to *generally* direct attention to the level of means. Such a general tendency to identify a goal on the level of means rather than outcome might increase the likelihood of attributing failure experiences to the level of means as well.

Contrary to our hypothesis, however, there was no support for a mediation of the effects of goal focus on well-being through means substitution. Thus, the positive relationship between process focus and well-being, the positive relation between process focus and means substitution, as well as the positive relation between means substitution and well-being were found to be independent of each other.

The main methodological shortcomings of Study 1 are that it is cross-sectional and based exclusively on self-report. To address these shortcomings, we conducted an additional study. Study 2 is a short-term longitudinal study with women who participated in a weight loss program. During the dieting phase, on a weekly basis, participants were asked to attribute their dieting success or failure to process- or outcome-related variables and to report their current weight.

## Study 2

Study 2 had two aims. First, we wanted to replicate the findings of Study 1. In addition, we wanted to test a more specific hypothesis, namely, that goal focus-related *attributions* have an effect on affective well-being and behavior. Whereas, in Study 1, participants only thought about their goal and how they *would* behave in the event of failure, in Study 2, we assessed actual evaluations of success and failure on the level of means and outcomes, respectively, during goal pursuit. In order to increase comparability across participants, the target goal was held constant, that being to lose weight. Participants were overweight and obese women. We chose the goal to lose weight for various reasons. First, overweight and obesity have severe social, psychological, and health consequences (for a review, see Stroebe, 2008), making the search for psychological factors that could help solve the problem an urgent task. Second, overweight women are typically highly motivated to lose weight. Third, it is possible to objectively assess progress towards attainment of the goal to lose weight. Fourth, losing weight permanently seems to be a very difficult goal and its pursuit is often hampered by setbacks (Mann et al., 2007). This makes it an interesting domain when investigating reactions to setbacks and failures. One of the main setbacks during dieting is failing to adhere to the caloric restrictions by eating more food than

prescribed by the diet or by eating other foods. Whereas some dieters react to such failures with disinhibited eating, others attempt to compensate for the failure by exercising or restricting future caloric intake. Disinhibition can be seen as indicating the substitution of one outcome with another, for example, substituting the goal to lose weight with an alternative competing goal like that of experiencing eating enjoyment, which is often observed in restrained eaters (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008; Stroebe, Papies, & Aarts, 2008). In contrast, compensatory efforts such as exercising or reducing future caloric intake can be seen as an indicator of means substitution.

We predicted that goal focus-related attributions would be related to whether dieters react with disinhibition (outcome substitution) or compensation (means substitution) when encountering setbacks in their dieting. More specifically, when dieters focus more on the means (i.e., *how* to lose weight), we expect them to switch to other diet-related means to compensate for a transgression. In contrast, when dieters who generally focus more on the outcome of their eating behavior (i.e., weight loss or enjoyment of food) fail, we expect them to switch to another goal (e.g., from losing 40 pounds to enjoyment of food or to losing only 20 pounds) and show disinhibited eating. Disinhibition is thought to result from “what the hell” cognitions after failing to resist a temptation while dieting (Polivy & Herman, 1985). Consistent with our hypothesis that disinhibition might be more likely when focusing on the outcomes rather than the means, Cochran and Tesser (1996) also argued that these “what the hell” cognitions result from identifying behaviors on higher, more abstract levels.

Moreover, a recent study by Burnette (2010) showed that dieters who think their body weight is fixed (entity theorists) rather than malleable (incremental theorists) report less persistence in dieting after a setback and are less successful in losing weight. As is known from other domains, such as academics, entity theorists tend to focus on assessing their ability (performance goals) rather than on mastering the task (learning goals), whereas the opposite is true for incremental theorists, which makes them better at overcoming setbacks. In line with

Burnette (2010), strong process-related attributions of failure while dieting should also foster learning goals after failure, namely, focusing on mastering the means of the diet after setbacks, whereas outcome-related attributions should foster performance goals after failure, namely, focusing on how well the outcome of weight loss has already been attained.

In sum, then, we hypothesize that attribution of failure to the process rather than the outcome should be related to higher affective well-being, less disinhibition (i.e., more compensation), and more successful weight loss.

Furthermore, Study 2 also explores the role of *success* attributions. We expected the process-related attribution of success to be followed by more successful weight reduction and less disinhibition. In the case of successful goal pursuit, identifying the means as appropriate might be more adaptive as it should increase the likelihood of maintaining these means. The research reported above (Freund et al., 2010; Pham & Taylor, 1999) also suggests that a process focus might be more adaptive as it results in higher persistence. In contrast, identifying success on the level of the outcome might lead to decreased effort as the outcome is likely to be perceived as being easy to achieve (Carver & Scheier, 1990; Martin, Ward, Achee, & Wyer, 1993). Moreover, achieving a target outcome perceived as being easy to achieve might also lead to a focus on the competing goal, for example, eating enjoyment (Fishbach, 2009; Förster et al., 2005). As Fishbach and Dhar (2003) demonstrated, experiencing progress towards goal attainment can lead to decreased motivation and goal-inconsistent actions. In their study, dieters were more likely to choose a chocolate bar as a reward after a feeling of closeness to the attainment of their weight loss goal had been induced. Following this line of argumentation, locating success on the level of desired outcomes of dieting could lead to a decrease in effort towards the target goal of weight loss and might foster leniency and even lead to disinhibition. As the questionnaire used in the present study (for details see Hennecke & Freund, in press) links disinhibition to the prior experience of a lapse, and not to the experience of success, we can only treat our results on how disinhibition is affected by success attributions as exploratory. The



assessment of weight loss, however, should be sensitive towards such goal-inconsistent behavior that results from measuring success on the outcome level and a decrease in motivation.

With regard to affect, we expect outcome attributions of success to be more beneficial than process attributions. As outcomes are higher in the goal hierarchy and more important, identifying their attainment, as opposed to the means, as successful should also result in better mood (see also Houser-Marko & Sheldon, 2008).

In summary, we hypothesized that stronger attributions of *failure* to the process (as compared to the outcome) (H3) should be positively related to (a) affective well-being during goal pursuit and to (b) means substitution (here, compensation instead of disinhibition), and to (c) successful weight loss. Furthermore, we explored the role of attributions of *success* to the means. They might be related to (a) *lower* affective well-being during goal pursuit, (b) less disinhibition (i.e., more compensation), and (c) more successful weight loss.

## Method

*Participants.* The study targeted overweight and obese women who all shared the goal of losing weight. Participants were recruited through advertisements in local newspapers. In short phone interviews prior to the study, women were asked to report their weight and height in order to make sure that they were overweight. Subsequently, 128 women with a Body Mass Index ( $= \text{kg/m}^2$ ; height and weight self-reported) of at least 25, the criterion for overweight as defined by the World Health Organization (n.d.), were invited to participate in the study. Two participants were excluded because their BMI was either below 25 or more than two standard deviations above the sample mean. The final sample consisted of  $N = 126$  women (19-77 years,  $M = 47.2$ ,  $SD = 15.9$ ). Women's initial weight was between 57 and 129 kg ( $M = 84.9$ ,  $SD = 13.8$ ) and their BMI ranged from 25 to 46 kg/m<sup>2</sup> ( $M = 31.6$ ,  $SD = 5.0$ ). They reported being overweight for one to 43 years ( $M = 13.8$ ,  $SD = 9.3$ ) and intending to lose at least 2 kg. Forty-nine (39%) of them held at least a university entrance qualification degree.

*Procedure.* Before the diet, participants were invited to the laboratory for assessment of their weight and height.<sup>2</sup> They were asked to start dieting on the first Monday after the instruction session, which took place on Fridays and Saturdays. In the instruction session, groups of 2 to 25 women were introduced to the diet<sup>3</sup> (“Brigitte Diet,” Gerlach, Ort-Gottwald, & Petersen, 2007) and received the book that explained the diet in detail. Participants agreed to adhere to the diet for six weeks. The Brigitte diet was chosen because an independent German consumer organization (Stiftung Warentest, 2005) recommended it as a healthy, balanced diet with a high probability of successful weight loss and subsequent maintenance.

During the six weeks of dieting, participants filled out online questionnaires every Saturday. The questionnaires were administered via the PHPSurveyor tool for online surveys (now: [www.limesurvey.org](http://www.limesurvey.org)). As a reminder, participants received e-mails with a link to the questionnaire. One week after the official end of the diet (i.e., about 7.5 weeks after the instruction session), participants were again weighed in order to have an objective measure of weight loss. Participation was reimbursed with 70 Swiss francs (about \$60).

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<sup>2</sup> Participants’ goal focus was also manipulated by their elaborating on either the means (process focus) or the outcome of dieting (or neither, in the case of the control group). During the six weeks of dieting, goal focus was continually manipulated via 36 diaries directing attention to either the outcomes (e.g., weight loss, figure enhancement: outcome focus) or the process of dieting (e.g., food preparation, eating behavior: process focus). Women in the control group received no diary. A manipulation check asking about how much participants were thinking about *what it would be like to be slimmer* (outcome focus) and about *how to eat low-caloric and low-fat foods* (process focus) revealed that the goal focus manipulation was not successful (MANOVA results for outcome focus:  $F(2,119) = 2.21, p = .12$ ; for process focus:  $F(2,119) = .39, p = .68$ ). Thus, only results from correlative analyses can be reported.

<sup>3</sup> The “Brigitte” diet is based on a balanced daily intake of whole foods (1200 kcal, 40 g fat), with fresh fruit and vegetables playing a major role. It is portioned out into five small meals each day: breakfast, a mid-morning snack, lunch, an afternoon snack, and dinner. Dieters can plan their day’s meals to include selections from combinations of recipes. The recipe book also encourages exercise and contains tips on how to best approach sport.

### *Weekly Measures.*

*Weight loss.* Participants indicated their current weight so that we could compute the difference between the previous week's and the current weight as an indicator of weekly weight loss.

*Attribution of failure and success to the process and the outcome.* Participants were to indicate how much they considered their previous week's diet a success or failure with regard to four dieting processes ("the way you persisted," "the way you have been dieting," "the way you resisted temptations," "your change in eating behavior") and four desired outcomes of dieting ("weight reduction," "appearance," "health," "well-being"). The scale ranged from -3 (*big failure*) to +3 (*big success*). To obtain separate scales for success and failure, for the failure scale the values above 0 were recoded to 0 and the negative values were recoded to positive ones, while for the success scale the values below 0 were recoded to 0 (Cronbach's alphas for all measurement occasions for process attributions of success > .89; for process attributions of failure > .78, for outcome attributions of success > .75, for outcome attributions of failure > .69).

To obtain an indicator of the relative salience of means versus outcomes when making attributions, we computed a difference score by subtracting the individual values on the outcome attributions scale from the individual scores on the process attributions scale. As a result, two scores per measurement occasion were obtained: one for the relative attributions of failure on the process level (which we will refer to as *process attribution of failure*), one for the relative attributions of success on the process level (which we will refer to as *process attribution of success*). Deriving separate indicators for success attributions and for failure attributions enabled us to test their differential role in affective and behavioral reactions to setbacks. As these transformations resulted in positively skewed distributions, we conducted additional analyses after log-transforming them (Cohen, Cohen, West, & Aiken, 2003). As these analyses did not change the pattern of results, we report only results from analyses with untransformed variables.

*Subjective well-being.* The 12-item short version of the Multidimensional Mood Questionnaire (Steyer et al., 1997) was used to measure affective well-being weekly. As in Study 1, a single aggregate score was created for positive affect at each measurement occasion (Cronbach's alphas for all measurement occasions > .88).

*Disinhibition after failure.* Disinhibition was considered a consequence of switching the outcome to eating enjoyment instead of weight loss. Disinhibition after initial diet lapses was assessed with a six-item questionnaire (Hennecke & Freund, in press; Cronbach's alphas for all measurement occasions > .64). Higher scores on the scale indicated a tendency to show disinhibited eating after diet lapses, whereas lower scores indicated compensation that was considered to indicate a means switch.

*Statistical analyses.* To account for the nested structure of the data (i.e., six measurement points at level 1 nested within  $N = 126$  persons at level 2), multilevel regression analyses were applied (linear mixed model procedure with SPSS.16). Restricted maximum likelihood parameter estimates (fixed intercept and slopes) were obtained by fitting multilevel regression models with first-order autoregressive residual covariance structures. Due to our hypotheses, multilevel models included only fixed effects of predictors (level 1) on affect, disinhibition and weight loss. We did not expect meaningful short-term changes over the six weeks of dieting. Hence, we did not estimate the effects of time on these outcomes. The interpretation of the multilevel fixed effects shown is equivalent to that of parameter estimates in ordinary least squares regression.

## Results

*Attribution of success and failure on the process (vs. outcome) level as predictor of weekly affect, disinhibition, and weight loss.* All results are displayed in Table 4.

*Weekly affect.* To account for individual differences in positive affect prior to starting the diet, we controlled for baseline positive affect. As hypothesized, the attribution of failure to the process (vs. the outcome) predicted weekly positive affect. The more participants attributed their dieting failure to the process, the more positive their affect. In other words, the higher the

Table 4: Study 2: Selected results from multilevel regression models: Fixed effects of process-related attributions of failure and success on positive affect, disinhibition, and weight loss

Model Parameter	Positive Affect <sup>a</sup>			Disinhibition (vs. compensation)			Weekly weight loss		
	<i>Estimate</i>	<i>SE</i>	<i>p</i>	<i>Estimate</i>	<i>SE</i>	<i>p</i>	<i>Estimate</i>	<i>SE</i>	<i>p</i>
Intercept	2.85	.06	< .001	2.67	.08	< .001	.66	.05	< .001
Process attribution of failure (PAF)	.18	.08	< .05	.07	.09	.45	-.04	.07	.68
Process attribution of success (PAS)	-.02	.07	.80	-.28	.07	< .001	.26	.07	< .001
PAF × PAS	.34	.07	< .001	-.03	.07	.89	.26	.09	< .01

*Note:* The predictors “PAF” and “PAS” were grand-mean-centered before the analyses. The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{PAF}_{ij} + \gamma_{02}\text{PAS}_{ij} + \gamma_{03}\text{PAF}_{ij} \times \text{PAS}_{ij} + u_{0j}$ .

<sup>a</sup> Regression weights after controlling for positive affect at baseline (*Estimate* = .38, *SE* = .05, *p* < .001).

outcome orientation in the case of failure, the more negative the participants’ affect. Interestingly, this main effect was qualified by an interaction between the attribution of failure and the attribution of success to the process (vs. outcome). A region-of-significance analysis (Preacher, Curran, & Bauer, 2003, 2006) revealed that the attribution of failure to the process and positive affect were only significantly related if at the same time attributions of success to the process were above the sample average (for  $p < .05$  and the grand-mean-centered predictor: lower bound of region of significance: -1.14; upper bound: -0.07, simple slopes are significant outside this region). This means that the beneficial effect of process attributions of failure only “kicked in” if attributions of success primarily referred to the process as well. As Figure 2 shows, positive affect was highest when both failure *and* success were attributed to the process and lowest when success, but not failure, was attributed to the process. There was no main effect of the attribution of success to the process (vs. outcome) level on affect.

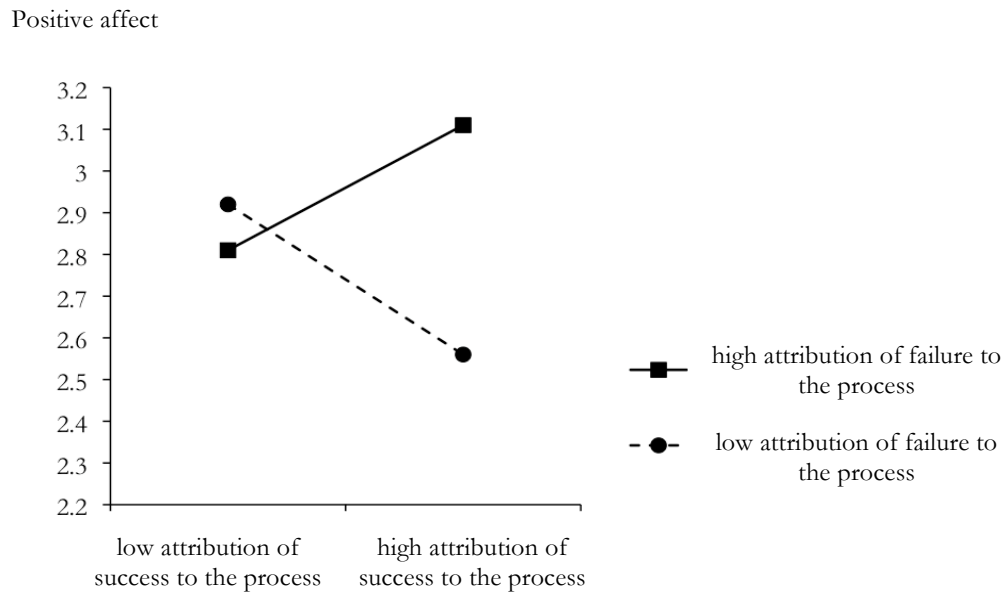


Figure 2: Effect of interaction between attribution of success and failure to process on positive affect. “High” and “low” groups refer to one *SD* above or below the sample mean

*Disinhibition.* We hypothesized that the attribution of failure to the process of dieting (vs. the outcome) is associated with less disinhibited eating after an initial failure to adhere to the diet. Results of a mixed model analysis revealed no main effect of whether dieters attributed their failure to the process or the outcome level. However, results indicate a significant main effect of process attributions of success. Thus, our hypotheses were only partly confirmed. Whereas failure identification did not affect subsequent disinhibition, the results suggest that attributing dieting success to the means results in less disinhibition. As expected, dieters stick to their means if they are perceived as successful.

*Weight loss.* The main effect of failure attributions on weight loss was not significant, but the interaction between attributions of failure and of success to the process significantly influenced weight loss. As a region-of-significance analysis indicated, the effect of attribution of success to the process was significant only if attribution of failure to the process was above average (for  $p < .05$  and the grand-mean-centered predictor: lower bound of region of significance:  $-2.67$ , upper bound:  $-.29$ ). In other words, the attribution of success to the process

was only beneficial for weight loss if it was accompanied by a medium to high level of attribution of failure to the process. As can be seen in Figure 3, when attribution of failure to the process was low, the extent of attribution of success to the process had no effect on weight loss. As was true for weekly positive affect, weight loss was highest when attributions of both failure and success to the process were high. In contrast, a low level of attribution of success to the process in combination with a high level of attribution of failure to the process was most maladaptive for losing weight.

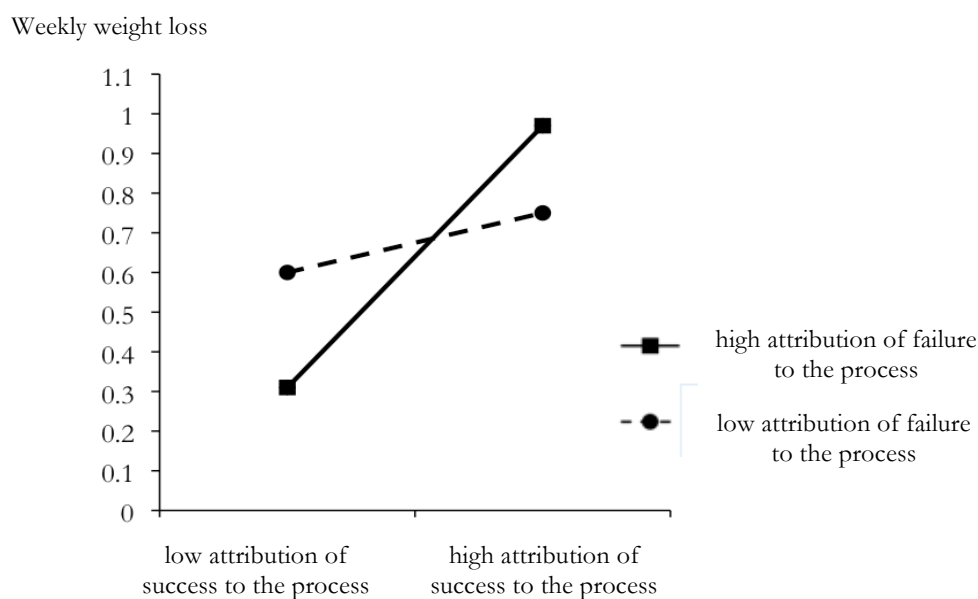


Figure 3: Effect of interaction between attribution of success and failure to process on weekly weight loss. “High” and “low” groups refer to one *SD* above or below the sample mean

### Brief discussion

Study 2 replicated and extended Study 1 by showing that goal focus influences affect and behavior. Confirming our hypotheses, attributing failure to the level of means was positively related to affect. Contrary to our hypotheses, however, success attributions had no effect on affect. Attesting to the general adaptiveness of a process focus, it was most beneficial to attribute both, failure and success, to the means. As indicated by a significant interaction, identifying the means as successful but the attainment of the outcome as failed was followed by the lowest

positive affect. This seems plausible given that participants must find it frustrating when they believe they are doing their very best to reduce their weight by sticking to the diet but are not losing a sufficient amount of weight.

With regard to disinhibition and weight loss, the following conclusions can be drawn. In general, attributions of success but not failure to the process predicted less disinhibited eating and more weekly weight loss. As expected, considering target outcomes to be attained might lead to decreased effort towards these outcomes (Fishbach & Dhar, 2003). The mere tendency to evaluate one's dieting success in terms of outcome rather than means might lead to a maladaptive coping with setbacks (Burnette, 2010). Weight loss was highest when the attribution of both failure and success to the process were high. More specifically, not identifying the means as appropriate when successful (low attribution of success to the process) while attributing failure to the wrong means (high attribution of failure to the process) was associated with less weight reduction. In general, the data show that attributions of failure and success have different consequences. Interestingly, they interact in complex ways when predicting affect and weight loss.

### **Discussion**

Two studies demonstrated the role of goal focus in reactions to failure (and success) during the pursuit of personal goals. Study 1 supported the hypothesis that primarily thinking about the means (relative process focus) is beneficial to well-being and fosters changing the means (means substitution) instead of changing the outcome (outcome substitution) in the event of failure. Behavioral reactions to failure, then, are based on whether the means or the outcome is considered problematic (or appropriate) during goal pursuit.

Unexpectedly, the relation between goal focus and affect was not mediated by means substitution. Rather, goal focus and behavior seem to influence affect independently of each other. Regardless of behavioral consequences, merely *thinking* about means or outcomes appears to influence people's affective states. This is in line with the finding by Freund et al. (2010) that



the induction of an outcome focus (here, listing the desired outcomes of going on a vacation) was followed by less positive affect than adopting a process focus (here, listing the means for going on a vacation). As Freund et al. (2010) argue, focusing on the desired outcomes implies having in mind what one does not have, directing attention to the negative discrepancy between the actual and the desired state. Although this discrepancy motivates goal-directed behavior, focusing on it seems likely to impede positive affect. In the event of failure, this effect might be stronger as the discrepancy between the actual and the desired state is even more salient. The result is in accordance with Houser-Marko and Sheldon (2008) who have shown the problematic effects of framing failure feedback in terms of the primary goal. Furthermore, a comprehensive review by Watkins (2008) indicates that repetitively thinking about the outcomes or consequences of one's behavior is less constructive than repetitively thinking about processes and contextual details with regard to a wide variety of outcomes.

We would like to add that, although means substitution might be very important for goal pursuit in the face of obstacles and setbacks, and was positively related to affective well-being, under some circumstances, the disengagement from a goal in favor of another, more attainable one, is more functional (see Wrosch, Miller, Scheier, & Brun de Pontet, 2007; Wrosch, Scheier, Miller, Schulz, & Carver, 2003).

Study 2 used a goal of high personal importance that is typically difficult to achieve and hence lends itself to the study of reactions to failure – the goal to lose weight. As expected, attributing dieting failure to the means of dieting was beneficial for positive affect. Furthermore, attributing both success and failure to the processes increases positive affect even stronger, whereas attributing success but not failure to the processes decreases positive affect, which is in line with our hypothesis. Contrary to our hypothesis, success attributions that refer to the outcome did not have a positive main effect on affect. In fact, it seems that attributing the success of dieting to the outcome seemed to be maladaptive as such attributions increased disinhibition and impeded weight loss. Indeed, as two further analyses revealed, both

disinhibition ( $Estimate = -.17, p < .001$ ) and weekly weight loss ( $Estimate = .05, p < .05$ ) had the expected effects on positive affect.

It seems more beneficial, then, to identify the means as the cause for success rather than focus on the desired outcomes. The attribution of success to the process indicates that the chosen path is successful and that one should stick to it. As a consequence, transgressions are reduced and compensation is identified as the appropriate strategy. In contrast, thinking of success primarily in terms of the outcomes such as well-being or appearance seems to be problematic. People who recognize success primarily on the outcome level might feel satisfied momentarily because they have attained something desirable (Carver & Scheier, 1990). However, this might reduce their motivation to continue goal pursuit, draw attention to competing goals such as eating enjoyment, and foster a tendency to “take it easy” with regard to the target goal for the day, or even reward themselves for these successes by eating more or high-caloric food (Fishbach, 2009; Fishbach & Dhar, 2003). However, as mentioned above, the results on how success attributions affect disinhibition should be interpreted with caution as the disinhibition questionnaire was not designed to assess how people behave after a successful diet. Nevertheless, it appears that experiencing a high level of outcome attainment might also facilitate “what-the-hell” cognitions after lapses, reduce compensatory efforts after lapses, and instead lead to disinhibition. In the long run, this cascade compromises successful weight reduction. We consider the results on weight loss as more reliable in this regard.

One unresolved inconsistency in the findings of Study 2 is that failure but not success attributions were related to affect. Success but not failure attributions, however, predicted the more behavioral outcomes of dieting (disinhibition and weight loss). This pattern of results is reminiscent of the dissociation of goal conflict and facilitation, on the one hand, and affect and goal-relevant behaviors, on the other. Whereas conflict is related to affect, facilitation predicts goal-relevant behaviors (Riediger & Freund, 2004). Negative motivational states (i.e., conflict,

failure attributions) seem to be more predictive of affect, whereas positive motivational states (i.e., facilitation, success attributions) are more predictive of behavioral indicators.

### **Causal directions**

The strongest limitation of both studies is that they do not entail experimental manipulations of goal focus or goal-focus-related attributions, thus not allowing a test of causal relations. However, we see no reason to assume that positive affect should lead to a stronger process focus or process-related attributions. In contrast, the opposite effect has been found. As found by Ketelaar and Clore (unpublished, cited by Clore et al., 2001), participants in positive moods characterized their behavior of making ratings in an experiment as relevant to abstract outcomes like “earning credit for introductory psychology,” whereas participants in negative moods characterized their behavior as relevant for more subordinate and concrete goals or processes like “completing forms.” Wegner and Vallacher (1986) have also shown that success feedback fosters behavioral descriptions referring to higher level and abstract goals, as opposed to failure feedback, which fosters behavioral descriptions referring to lower level, more concrete goals. Moreover, in Study 2 we were also able to control for baseline positive affect, thus modeling changes in affect over the period of dieting.

Could behavioral reactions have a causal effect on goal focus and its related attributions? It is possible that substituting means directs attention to the means or might even cause justifications of behavioral decisions (e.g., “I changed the means because the previous means were not successful”). It stands to reason, however, that it is more likely that behavior influences cognition than vice versa. It seems more plausible that people who have identified their means as being unsuccessful adopt new means.

Similarly, it seems unlikely that successful goal pursuit (e.g., weight loss, a low level of disinhibition) should lead to a stronger process focus. Again, we refer to Vallacher and Wegner (1987, 1989) who reported that when a behavior can be successfully executed or a goal successfully pursued, a focus on abstract outcomes is the default mindset. A focus on the lower

level of means is only triggered when it is difficult to execute a particular behavior or when behavior execution is followed by failure feedback (Wegner & Vallacher, 1986).

### **Future directions**

The current research demonstrates that, generally, a process focus is more adaptive than an outcome focus. There might be interesting individual differences moderating the relationship between goal focus and subjective well-being. One such moderator might be chronological age. Evidence exists that younger adults are more outcome-focused than older adults (Freund et al., 2010). As younger adults have to make important life decisions, focusing on the outcome might provide more relevant information about the different options than focusing on the means of pursuing these goals.

Another moderating factor for the adaptiveness of goal focus might be the motivational phase. As goal pursuit encompasses different action phases (Heckhausen, 1989), being able to flexibly switch between goal foci and related attributions depending on the current phase might be more adaptive than being simply process-focused. According to Heckhausen's model of action phases, goal-directed behavior starts with a predecisional phase in which different outcomes are compared. In this phase, outcome-related cognitions and attributions might be more adaptive than in other phases. In contrast, in a postdecisional phase when the means for goal pursuit have to be chosen and implemented, process-related attributions might be more adaptive (Freund et al., under review; Gollwitzer, 1990; Gollwitzer & Bayer, 1999). There is some evidence for phase-specific adaptiveness of goal focus in studies on skill learning by Zimmerman and Kitsantas (1997, 1999).

### **Conclusion**

Two studies provide initial evidence for the role of goal focus in guiding behavioral and affective reactions to failure. When failure is encountered, being process-focused and attributing failure to the wrong means is more beneficial for future motivation and subjective well-being than being outcome-focused. When goal pursuit is successful, process-related identifications also

foster further success as indicated by greater weight loss during a diet. Complementing research by Vallacher and Wegner (1987, 1989) who showed that people tend to focus on abstract outcomes when goal pursuit is successful, the current studies show that this is not necessarily most beneficial. Rather than deliberating about *why* we are doing something when succeeding or failing in pursuing our goals, we might be better off focusing on *what* we are doing. As Thomas A. Edison said: “I have not failed. I've just found 10,000 ways that won't work.”

**PART III: ON GAINS AND LOSSES, MEANS AND ENDS: GOAL ORIENTATION  
AND GOAL FOCUS ACROSS ADULTHOOD**

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### Abstract

Personal goals guide behavior towards a desired outcome, motivate behavior over time and across situations, provide direction and meaning, and contribute to the acquisition of skills and subjective well-being. The adaptiveness of goals, however, might vary with dimensions such as their orientation towards the achievement of gains, maintenance of functioning, or the avoidance of losses. We argue that goal orientation is most adaptive when it corresponds to the availability of resources and the ubiquity of losses. In line with this argument, younger adults show a predominant orientation towards, whereas goal orientation shifts towards maintenance and avoidance of loss across adulthood. This shift in goal orientation seems adaptive both regarding subjective well-being as well as engagement in goal pursuit. A second goal dimension that has been largely overlooked in the literature is the cognitive representation of goal pursuit primarily in terms of its means (i.e., process focus) or its ends (i.e., outcome focus). This chapter investigates the antecedents and consequences of goal focus. In particular, it highlights the importance of factors related to chronological age (i.e., the availability of resources, future time perspective, goal orientation, motivational phase) for the preference for and adaptiveness of an outcome or process focus. Finally, we posit that a process focus leads to more adaptive behavioral and affective reactions when people encounter failure during goal pursuit.

*Keywords:* Adult development, goal orientation, goal focus, means, ends, resources, time perspective, failure

## Introduction

Imagine a young woman in her mid 20s and her grandmother, an older woman in her late 60s. Now think about the personal goals they might pursue. Most likely, the younger woman will pursue goals related to finding a life partner, to finishing her education and to establish a professional career. The goals of the older woman are more likely to center around the domains of health, cognitive functioning, independence, and the well being of her loved ones (Freund & Riediger, 2006). Beyond the differences in content, however, two other age-related differences in the goals of a younger and an older adult might be evident. First, the orientation of goals is likely to shift from gains in young adulthood to maintenance in middle adulthood and the prevention of losses in older age (e.g., Freund & Ebner, 2005). For example, a young woman might aim at improving her fitness level, whereas her grandmother might be more likely to try to maintain her physical fitness in the face of aging. Second, younger adults might focus more on the outcome of goal pursuit whereas older adults might focus more on the process (Freund et al., 2010). For example, the young woman might focus on the desired outcome of exercising regularly such as her body shape and her overall fitness. In contrast, her grandmother might think primarily about how she can to exercise regularly in a manner that makes her feel good already during exercise. In this chapter we aim at integrating these two dimensions of personal goals and discuss their change across adulthood. First, however, we want to highlight the importance of personal goals throughout the lifespan.

### The importance of goals for adult development

Laypeople as well as motivation researchers seem to agree that setting and pursuing goals has positive consequences. Goals give life meaning, direction, and contribute to happiness and subjective well-being (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). Goals have been defined as cognitive representations of personally desired (or dreaded) states to be approached (or avoided), such as becoming a nurse (or not becoming like one's parents) through action. More specifically, they encompass *means* of goal pursuit and desired *outcomes* of it (e.g., Kruglanski,



1996). The activation of goals affects the encoding, storage, and retrieval of information, and guides attention as well as behavior (e.g., Wyer & Srull, 1986). As goals are comprised of means and ends, goals might channel and organize information in terms of means and ends (e.g., Woike, Lavezzary, & Barsky, 2001). Each time a goal is activated, the associated means and ends (as well as their emotional correlates such as enjoyment or fear) are also activated. Consequently, the activation of goals enhances the likelihood of engaging in goal-relevant behaviors (i.e., means), which can occur even automatically (e.g., Bargh & Ferguson, 2000; Bargh & Gollwitzer, 1996). Goals, then, direct attention and information processing and motivate behavior. Thereby, goals organize behavior over time and across situations, and provide a sense of direction and purpose in life (Freund, 2007). Moreover, research suggests that goal pursuit enhances performance (e.g., Austin & Vancouver, 1996; Emmons, 1989, 1996; Freund, 2007). Therefore, it is not surprising that the goal concept seems particularly well suited for understanding how people develop successfully over time.

However, as Ryan and colleagues put it: Not all goals are created equal (Ryan, Sheldon, Kesser, & Deci, 1996). Goals differ in their content, concreteness, difficulty, time frame, and their orientation towards gains and losses (e.g., Austin & Vancouver, 1996; Freund & Ebner, 2005; Little, 1989; Locke & Latham, 2002; Wiese & Freund, 2005). Such goal dimensions influence the adaptiveness of goals. Various goal dimensions have been distinguished, such as approach – avoidance (e.g., Elliott & Friedman, 2007), promotion – prevention (e.g., Higgins, 1997), intrinsic – extrinsic (e.g., Deci, Koestner, & Ryan, 1999; Krapp, 2005), and mastery – performance (e.g., Dweck & Leggett, 1988). This chapter centers around two goal dimensions that we believe to change systematically across adulthood: First, the orientation of personal goals towards gains, maintenance, or the prevention of losses (e.g., Freund & Ebner, 2005). Second, whether a person focuses on the *outcome* of goal pursuit (short-term and long-term consequences) or on the *process* of goal pursuit (means of goal attainment) (e.g., Freund et al., 2010; Sansone & Thoman, 2005; Zimmerman & Kitsantas, 1997).

The importance of personal goals for adult development has been acknowledged by different action-theoretical approaches (e.g., Brandtstädter & Renner, 1990; Heckhausen & Schulz, 1995; Freund & Baltes, 2000). In particular, the model of selection, optimization, and compensation (SOC-model, Baltes & Baltes, 1990) has stressed the importance of setting, pursuing and maintaining personal goals for successful development.

### **Successful development through personal goals**

One of the central propositions of lifespan psychology is the *multidirectionality* of development. That is, development comprises not only trajectories of growth but also trajectories of decline (Baltes, 1987; Labouvie-Vief, 1981). Successful development has often been defined as the maximization of gains and the simultaneous minimization of losses (see Freund & Riediger, 2003, for a review of definitions of successful development). According to the SOC-model (Baltes & Baltes, 1990), an optimal ratio of gains to losses can be achieved by the orchestrated use of three processes of developmental regulation, namely selection, optimization, and compensation. As elaborated in more detail elsewhere (e.g., Freund & Baltes, 2000; Freund, Li, & Baltes, 1999; Freund, 2006a), the action-theoretical specification of the SOC-model posits that developing and committing to a hierarchy of personal goals (i.e., *elective selection*) and engaging in goal-directed actions and means (i.e., *optimization*) are essential for achieving higher levels of functioning (i.e., maximizing gains). In order to maintain a given level of functioning in the face of inevitable losses in resources people encounter throughout their lives, people need *compensate* for their losses (e.g., by substituting goal-relevant means that are no longer available). When the costs for optimization or compensation outweigh the expected gains, according to the SOC-model it is more adaptive to reconstruct one's goal-hierarchy by focusing on the most important goals, developing new goals, or adapting goal standards (i.e., *loss-based selection*). Thus, the SOC-model conceptualizes processes promoting gains (elective selection, optimization) but also processes to counteract losses (compensation, loss-based selection).

Empirical evidence supports the adaptiveness of self-reported selection, optimization, and compensation throughout adolescence (Gestsdottir & Lerner, 2007), adulthood and into very old age (e.g., Freund & Baltes, 1998; 2002; Wiese, Freund, & Baltes, 2000; 2001; Ziegelmann & Lippke, 2007). The use of SOC strategies seems to be particularly helpful for persons with fewer resources (Jopp & Smith, 2006; Lang, Rieckmann, & Baltes, 2002; Young, Baltes, & Pratt, 2007).

### **Goal selection: Managing multiple goals**

A series of studies by Riediger and colleagues (Riediger & Freund, 2004, 2006, 2008; Riediger, Freund, & Baltes, 2005) demonstrated the role of the *selection* of goals for successful goal pursuit. More specifically, results by Riediger and colleagues stress the importance of considering the interrelations of personal goals. Conflict between goals might occur because resources are insufficient to support both goals at the same time or through incompatible strategies. For instance, wanting to enjoy food and trying to lose weight imply incompatible eating behaviors, leading to goal conflict. Goals can facilitate each other by sharing the same strategies. For example, the two goals to lose weight and to lead a healthy life style are both served by the same strategy of working out regularly. Goal conflict and facilitation have are two largely independent goal dimensions and show differential associations with affective experience and goal-relevant behavior. Goal conflict seems to impair affective well-being, facilitation is associated with goal pursuit in everyday life and subsequent goal attainment (Riediger et al., 2005). Interestingly, older adults appear to gain in motivational competence regarding the selection of goals. They report more goal facilitation and less conflict among their goals than younger adults (Riediger et al., 2005). Importantly, this result was not simply due to a reduction in the number of goals but to focusing on personally important, superordinate goals. Focusing one's goals on central and similar life-domains contributed to higher facilitation among goals, which, in turn, lead to stronger goal engagement and achievement (Riediger & Freund, 2006). Age-related increases in motivational selectivity, then, are one way of managing the increasing limitation of resources in adulthood. Another way of dealing with conflicts due to goals competing for the same limited

resources is prioritizing. Wiese and Freund (2001) showed that young adults who experience conflicts between work- and family-related goals report fewer strains and higher subjective well-being when they prioritize one goal (and temporally postpone the other). Taken together, this research supports the importance of selection as a key process for successfully managing multiple goals.

### **Optimization and compensation: A tale of the shifting goal orientation across adulthood**

As mentioned above, one of the central tenets of life-span developmental psychology holds that development encompasses both gains and losses throughout the life span. Examples for ubiquitous losses in later adulthood are health-related and cognitive decline or the loss of social partners and social status through retirement (Baltes & Smith, 2003). In contrast, affective well-being (e.g., Röcke, Li, & Smith, 2009), motivational competence (e.g., Riediger & Freund, 2008) or self-regulation (Hennecke & Freund, in press) appear to increase across adulthood and into old age. The ratio of gains to losses, however, changes across the life span, encompassing decreasing gains and increasing losses throughout adulthood and into old age (e.g., Baltes, 1997; Baltes, Lindenberger, & Staudinger, 1998; Heckhausen, Dixon, & Baltes, 1989). Addressing this changing ratio of gains to losses, the SOC-model holds that goals directed at the optimization of gains might be more important at younger ages whereas goals directed at the maintenance and avoidance of losses might gain in importance with increasing age.

Arguing from an evolutionary standpoint as well as from a developmental perspective, it is advantageous to possess as many resources as possible (Freund & Riediger, 2001). Resources are essential for reproductive success and survival. They signal success, relative social standing, and good genetic material to potential mates. They enhance attractiveness and successful reproduction and provide for the upbringing of offspring (Buss, 1999). Gaining resources appears to be a primary motivation in young adulthood, a phase in life when most people have not yet had opportunities to accumulate many resources that are advantageous for their reproductive success. Moreover, social expectations and developmental tasks for young adults are

geared towards gains (e.g., gaining education or professional skills, founding a family, building a home, establishing a career). Young adults have large potentials for functional gains and still need to realize these potentials. As Raynor (1982) puts it, younger adults are still in the process of “becoming.” In other words, before younger adults can start protecting and conserving resources, they need to acquire skills and resources and build upon their status. In contrast, with increasing age, one is increasingly likely to have reached one’s personal asymptote of performance in many areas of life, making the achievement of new gains less and less likely. Moreover, throughout their lives older adults have accumulated resources including skills, material belongings, as well as social relations that need to be protected against losses. Given the ubiquity of losses in older adulthood and the corresponding social expectations (Heckhausen et al., 1989), older adults are likely to be chronically aware of threatening losses.

In late adulthood, then, preserving resources and counteracting losses may become the primary motivation outweighing tendencies to accumulate new resources (Freund & Ebner, 2005; Staudinger, Marsiske, & Baltes, 1995). Consistent with this hypothesis, J. Heckhausen (1999) found that younger adults reported more goals in domains associated with striving for gains and fewer goals in domains reflecting the avoidance of losses than middle-aged or old adults. Similarly, Ebner et al. (2006) showed that, compared to older adults, younger adults rated their personal goals as having a stronger focus on gains. Conversely, older adults reported a higher focus on maintenance and prevention of loss in their personal goals than younger adults. Moreover, in two further studies using a forced-choice paradigm for tasks pertaining to physical fitness and cognitive functioning, younger adults were more likely to adopt goals focusing on achieving new gains compared to older adults who preferred goals focusing on the maintenance of their level of functioning. Attesting to the role of resources for goal-orientation, Ebner et al. (2006) showed that younger adults shifted to a preference for maintenance goals when resources were perceived as being limited.

The shift in goal orientation across adulthood seems adaptive. Whereas younger adults seem to suffer from a goal orientation towards maintenance and avoidance of loss, older adults' subjective well-being was positively related to a maintenance orientation. Using behavioral indicators of goal pursuit, Freund (2006a) showed that younger adults pursue a given goal more persistently when it is oriented towards achieving gains (optimization goal), whereas older adults are more persistent when pursuing the goal to counteract losses (compensation goal). In addition, when confronted with a resource loss, compensatory activities are related to positive affect in older adults (Duke, Leventhal, Brownlee, & Leventhal, 2002).

In sum, then, goal orientation towards gains and losses appears to change with the shifting ratio of gains to losses across adulthood. Moreover, this shift in goal orientation seems adaptive both regarding subjective well-being as well as actual goal pursuit.

### **Goal focus: Process or outcome**

The previous sections focused on *goal selection* and the shift in goal orientation towards gains and losses across adulthood. In the following, we want to address how the cognitive representation of *goal pursuit* primarily in terms of its means (process focus) or its outcome (outcome focus) might affect goal-relevant behavior as well as affect, and how it might change with age.

Let us open this section with an example of process and outcome focus. Two people pursuing the goal of completing a 20-km hike in the Alps within five hours may focus on very different aspects of this goal: One of them might focus primarily on the consequences of successfully reaching the destination within the allotted time, while the other might focus more on pacing herself by monitoring her pulse rate and breathing. What factors determine whether a person focuses more on the outcome or the process when pursuing goals? Are there differences in adaptiveness of a stronger focus on the outcome or the process of goal pursuit? We posit that factors related to chronological age, namely the availability of (physical and cognitive) resources, future time perspective, and a goal orientation towards achieving gains or maintenance of

functioning contribute to a preference for and adaptiveness of either an outcome or a process focus during goal pursuit. In addition, taking a closer look at the dynamics of goal setting and pursuit, we posit that the motivational phase and the closeness to a deadline determine whether people focus on the process or the outcome of goal pursuit. Finally, we discuss the role of goal focus when goal pursuit is hampered by setbacks or failure.

The concept of outcome and process focus is related – but not identical – to the concepts of extrinsic and intrinsic motivation as well as performance and mastery orientation. In accordance with Sansone and Thoman (2005), we define *outcome focus* as the motivation to engage in an activity because it is a means to a certain *end*. We define *process focus* as the cognitive salience of aspects of the goal that are related to the *means*, though, whereas Sansone and Thoman define it as the (expected) experience of interest in an activity. It is likely that people only persist in a certain activity for longer periods of time, however, if they experience it as being somehow rewarding, be it due to their interest in it, their positive affect, or its instrumentality for achieving a desired outcome. Focusing on the outcome or the process of goal pursuit is like beaming a flashlight on either the means or the end of goal pursuit, thus highlighting aspects of goal pursuit either related to the process (e.g., Do I have the means necessary to achieve this goal?) or the outcome (e.g., When will I achieve the goal?).

### **Differentiating goal focus from related constructs**

*Linking outcome and process focus to extrinsic and intrinsic motivation.* Extrinsic motivation is characterized by a focus on the consequences of goal achievement (e.g., external rewards for achieving a certain goal), whereas intrinsic motivation is typically defined as a focus on the task at hand (e.g., enjoyment of or interest in the goal-relevant activity). Compared to extrinsic motivation, intrinsic motivation is associated with voluntary involvement, more interest, and higher persistence in a task (e.g., Deci et al., 1999; Krapp, 2005; Lepper, 1981). Intrinsic motivation implies that a person focuses on the satisfaction derived from the activity rather than on the external consequences of goal achievement. For instance, when one's goal is to paint a

picture, either the amount of money the picture will bring in at the next exhibition (i.e., extrinsic motivation) or the enjoyment of and interest in the activity of painting (i.e., intrinsic motivation) could be in the foreground. Engaging in goal pursuit for tangible, external rewards has been shown to undermine intrinsic motivation (Deci et al., 1999).

At first glance, the definition of intrinsic and extrinsic motivation greatly resembles process and outcome focus. Intrinsic motivation entails a focus on the process, extrinsic motivation a focus on the consequences of attaining a certain outcome. The opposite is not true, however, as the concept of goal focus is mute regarding the underlying reasons for engaging in goal pursuit. For instance, a person might focus on the outcome of goal pursuit (e.g., a beautiful painting) for a goal that was set autonomously and will bear no further consequences such as praise or tangible rewards. Extrinsic motivation implies a concern about the *consequences* of attaining an outcome (e.g., receiving a monetary reward from parents for achieving a good grade), not about the outcome itself. Regarding process focus, a person might focus on the process of goal pursuit (e.g., painting) because she is positively reinforced for doing so (e.g., through teachers' praise for her talent and perseverance). Process focus, then, is not necessarily associated with intrinsic motivation.

*Linking outcome and process focus to performance and mastery goal orientation.* Another goal dimension related to goal focus is performance and mastery goal orientation. Dweck (e.g., Dweck & Leggett, 1988) defines performance goal orientation as a focus on how well one is doing (particularly as compared to others), whereas mastery goal orientation represents a focus on learning and mastering a skill. Dweck traces these two types of goal orientation back to beliefs about skills as fixed (i.e., an entity) or malleable (i.e., incremental), respectively. In the first case (entity theory), performance is seen as an indicator of the underlying ability and provides feedback about an unchanging trait. In the latter case (incremental theory), feedback is a means of improving one's skill level. A number of studies in educational settings have shown that setting mastery goals promotes interest in and enjoyment of goal pursuit, but that performance



goals are typically associated with a higher level of performance (e.g., Harackiewicz, Barron, Trauer, Carter, & Elliot, 2000; for a review, see Dweck & Molden, 2005). In the area of organizational behavior, however, mastery goals (in this context often labeled “learning” goals) have been shown to be positively linked to the successful acquisition of new skills, feedback seeking, and performance (e.g., VandeWalle, 2001; VandeWalle, Brown, Cron, & Slocum, 1999).

Seijts and Latham (2005) posit that the adaptiveness of goal focus depends on the goal at hand. If the means and strategies of goal pursuit are not (yet) known or mastered, learning goals should enhance performance because attention is focused on the means of goal pursuit while focusing on performance might actually distract and hinder successful goal pursuit. In a similar vein, and using the terminology of process and outcome focus, Zimmerman and Kitsantas (1997, 1999) point out that, when learning to master a new task, people are more likely to adopt a process focus, defined by these authors as a focus on the acquisition of (strategic) skills (i.e., mastering the various elements and steps of a complex skill such as writing or dart throwing) or, in other words, on the means for achieving a given outcome. Outcome focus, in contrast, presupposes mastery of the different elements of which a complex skill is comprised and denotes a focus on the actual outcome (i.e., performance level). In line with Seijts and Latham (2005), Zimmerman and Kitsantas found that a focus on the acquisition of skills and means (i.e., process focus) is beneficial when learning a new skill whereas outcome focus enhances performance when the means need to be implemented as an integrated whole in the service of goal attainment (Zimmerman & Kitsantas, 1997, 1999). This result can be taken as first evidence for the hypothesis that goal focus and its adaptiveness depend on skill level.

Before we elaborate on the role of age for goal focus, let us summarize the main differences between process and outcome focus.

### **Main differences between process and outcome focus**

Table 5 summarizes the main differences between process and outcome goal focus, which will be elaborated below.

Table 5: Differences between process and outcome goal focus

Process goal focus	Outcome goal focus
Action/means	End state
Subordinate goals (concrete)	Superordinate goals (abstract)
Contextualized	Decontextualized
Provides vague or no standard of comparison	Provides clear standard
Provides guidelines for action	Provides direction, meaning

First, let us point out that the differences highlighted in Table 5 are relative not absolute. Typically, however, actions and the means of goal pursuit are more concrete than outcomes (Carver & Scheier, 1998). Similarly, actions take place in specific situational contexts (e.g., studying for the SAT), whereas outcomes are more decontextualized (e.g., achieving a certain SAT score). Another feature distinguishing outcome and process focus is the clarity of standards of comparison between actual and desired states. Outcome focus is more likely than process focus to provide a clear standard of comparison because outcomes typically entail criteria regarding when they are reached (e.g., arriving at a destination within five hours). By comparison, it is much more difficult to define the standards of comparison for the means of goal pursuit without referring to the outcome (e.g., enjoying a hike is less clearly defined than reaching the destination in a given amount of time). Finally, researchers agree that higher-order, abstract goal representations (i.e., outcome focus) provide direction and meaning in life, whereas lower-order, concrete goal representations (i.e., process focus) provide guidelines for action (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). As Little (1989) pointed out, however, people do not want to know *why* they are doing something but also *what* they should be doing. It seems, then, that neither of the two is in and of itself more adaptive. Instead, as discussed below, the effects of goal focus are hypothesized to depend on factors related to chronological age.

### Age and goal focus

As for the development of skills during adulthood, one could argue that skill level is associated with age. In many domains of life, young adults are still in the process of acquiring the means and skills relevant for goal pursuit, such as skills needed in the professional/work domain or in the area of establishing a long-term partnership and family. This might force young adults to focus more closely on the acquisition of skills or the process of goal pursuit (Zimmermann & Kitsantas, 1997, 1999). Middle-aged and older adults are more likely to have acquired most of the skills necessary to pursue their goals in both the work as well as the social domain and, thus, could be seen as being more likely to focus on the outcome of goal pursuit. Moreover, as Kanfer and Ackerman (2004) point out, skills can also be defined in terms of the balance between investment of resources and payoff. In the context of work-related motivational development during adulthood, they argue that the payoff for resource investment decreases with age, leading younger adults to be more focused on resource investment and older adults on the outcome. Below, we will argue however, that other factors related to chronological age – the availability of resources, future time perspective, goal orientation towards gains or maintenance / avoidance of loss – suggest that, overall, the primary goal focus is expected to shift from the outcome to the process of goal pursuit across adulthood.

Some goals might lend themselves more to a process focus than others. For instance, goals related to an enduring characteristic (e.g., to be a friendly person) or maintaining some state (e.g., to stay healthy) require working constantly on the goal and might therefore be more suitable for a process focus than goals specifying an endpoint (e.g., to pass an exam). Therefore, maintenance goals may be more likely to be associated with a process focus, whereas goals involving the achievement of new outcomes (i.e., growth) should be more likely to invoke an outcome focus. As has been shown by Ebner et al. (2006), availability of resources is one of the factors determining whether growth or maintenance goals are adopted. When resources are perceived as being limited, people might feel that achieving new outcomes (growth) is less likely

and desirable than focusing on the task at hand, namely, the process of goal pursuit. Similarly, as suggested by construal level theory (Trope & Liberman, 2003), goals that are temporally distant are more likely to be represented in an abstract way and in terms of ends, whereas shorter temporal distance of goals should lead to a more concrete representation of the means (“do” goals, according to Carver & Scheier, 1998). Taken together, preference for a certain goal focus might vary by variables such as time perspective (Carstensen, Isaacowitz, & Charles, 1999) and availability of resources (e.g., Freund & Ebner, 2005). Both time perspective and available resources have been shown to be negatively related to chronological age (e.g., Baltes & Smith, 2003; Lang & Carstensen, 2002). Therefore, one could expect an increase in process focus and a decrease in outcome focus during adulthood (see Figure 4).

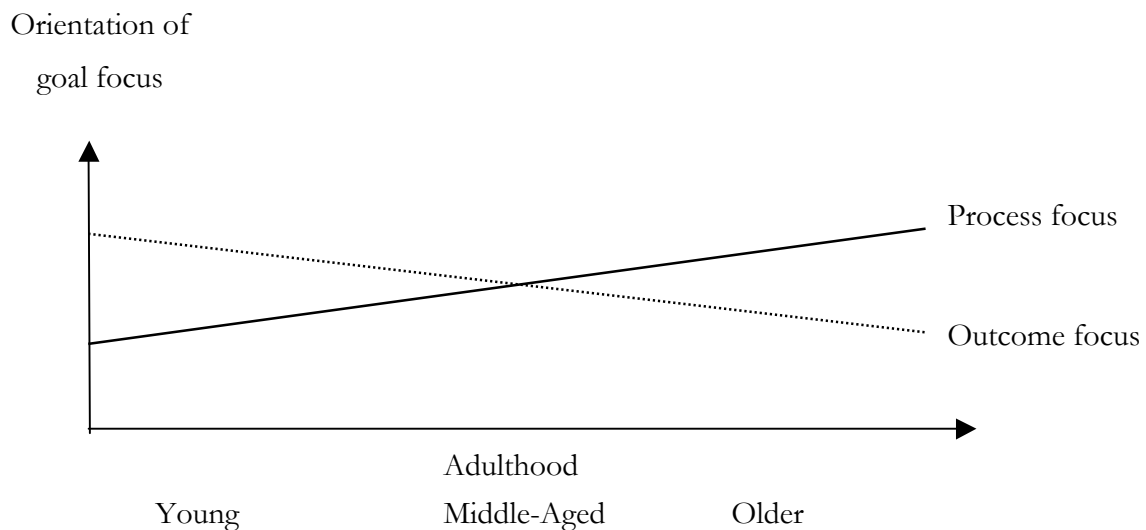


Figure 4: Hypothesized trajectories of process and outcome focus across adulthood

As pointed out above, the developmental tasks of young adults entail the achievement of growth goals, which have an inherent *outcome*-oriented aspect due to the tangible nature of task achievement consequences (viz., a diploma, a job, a mate, a child). Thus, young adults may develop a more outcome-oriented approach to task achievement and *outcomes* are likely to become highly salient during young adulthood. Later on, however, adults – especially older adults – goal

orientation shifts towards maintaining one's level of functioning and avoiding losses (Ebner et al., 2006; Freund, 2006b). Orientation towards maintenance / avoidance of losses implies a constant monitoring of one's actual performance vis-à-vis a progressively declining level of functioning. Thus, orientation towards maintenance and loss-avoidance has an inherent *process*-oriented aspect. Accordingly, older adults may develop a more process-oriented approach to goal achievement. In addition, achieving new outcomes typically takes time. However, when one's future becomes more and more limited, growth goals with their inherently more distant outcomes might be viewed as less applicable to one's own life than maintenance goals with their inherently more immediate nature (as necessitated by constant monitoring). Thus, given that future time perspective decreases with age (Lang & Carstensen, 2002), one might expect older adults to be more process-focused.

*Resources and goal focus.* The importance of achieving gains and accumulating new resources in young adulthood (see above) is likely to result in a focus on achieving certain outcomes. Middle-aged adults might hold an equally strong process and outcome focus because, on the one hand, they are starting to experience a shift in resources toward decline and are, in many areas, at their peak in performance, making achievement of new outcomes less likely. This should lead to a stronger focus on the process of goal pursuit. On the other hand, middle-aged adults typically still experience their resources such as (life-)time and vigor as plentiful, and might therefore still aspire to reach certain outcomes because gains are still possible (Baltes et al., 1998; Freund & Ebner, 2005; Staudinger et al., 1995). This pattern clearly changes in old age, when resources decline (Baltes & Smith, 2003) and achieving new outcomes becomes less likely and goal orientation shifts towards maintenance and loss-avoidance. As maintenance goals lend themselves more to process focus than do growth goals, older adults should also be more likely than younger or middle-aged adults to adopt a process focus.

This hypothesis is also consistent with Kanfer's resource model (e.g., Kanfer, 1987; Kanfer & Ackerman, 2004), which proposes that motivation (defined here as effort) depends on

the perceived effort-performance function (i.e., the expected level of performance upon investing a certain amount of effort into a task at hand), the performance-utility function (i.e., the consequences of attaining a certain level of performance), and the effort-utility function (i.e., the payoff for investing effort into a task at hand). When resources decrease (e.g., as does fluid intelligence during adulthood), the expected payoff for investing effort declines, so older adults are expected to invest less effort into tasks involving resources on the decline. When resources are plentiful or even increasing (e.g., crystallized intelligence during adulthood), the expected payoff for investing effort increases, so effort will be invested into tasks involving resources that are increasing. Applied to the work domain, Kanfer and Ackerman (2004) propose that “among older workers, work motivation will be less determined by level of performance achievement and, rather, more determined by judgments of how much effort is required for requisite performance . . . and the utility of allocating that effort” (p. 451). This proposition is consistent with the view that older adults’ goal focus shifts from being primarily concerned with achieving a specific outcome (here, performance level) and more with the process of goal achievement (i.e., investment of effort).

*Time perspective and goal focus.* Attempting to achieve certain outcomes requires adopting a future time perspective. Zimbardo and Boyd (1999) even view outcome focus and the ability to postpone immediate gratification in order to attain a goal at some later point in time as part of their concept of future time perspective. In contrast, present orientation is characterized by a more hedonic approach to life with a focus on more immediate gratification and less concern for consequences that lie in the farther future. Therefore, one could argue that an extended future time perspective is more likely to be associated with outcome focus, whereas shorter future time expansion might be associated with a focus on the process of goal pursuit that is taking place in the present. Investing into the future only makes sense when there is a future in which to reap the fruits of one’s efforts. Consistent with this view, in their studies testing socioemotional selectivity theory (SST), Carstensen and her colleagues (e.g., Carstensen et al., 1999) consistently

show that a limited future time perspective is related to focusing on emotionally meaningful social goals. In contrast, a longer future time perspective is associated with information seeking, which can be seen as an investment in the future. As Fung and Carstensen (2004) put it, “When the future is perceived as open-ended, future-oriented goals weigh most heavily and individuals pursue goals that optimize long-range outcomes” (p. 68), and “when time is perceived as limited, emotionally meaningful goals (...) are pursued because such goals have more immediate payoffs” (p. 68).

In her studies, Carstensen shows that, contrary to younger adults, older people are more likely to restrict their social contacts to close social partners and emotionally meaningful social interactions. It is not old age per se, SST argues, but the shorter future time perspective of older people that is responsible for this shift in social goals. In fact, Lang and Carstensen (2002) show that age is negatively related to future time perspective. Moreover, when experimentally restricting younger adults’ time perspective, they orient themselves more towards meaningful interactions with close social partners rather than investing into the future by selecting partners that might provide useful information (for a summary, see Carstensen et al., 1999). Research on SST suggests that an extended future time perspective is likely to be associated with a focus on the outcomes of goal pursuit whereas a limited time perspective brings about a focus on the present and, therefore, a more immediate payoff. With a limited future time perspective, people should be more concerned with the more immediate process of goal pursuit rather than the more distant outcome thereof.

*Change vs. stability orientation and goal focus.* In this section, we take a different perspective on gain and maintenance / avoidance of loss goal orientation by shifting the emphasis of this distinction away from gains and losses towards stability and change. From a developmental viewpoint, striving for the achievement of new gains implies an orientation towards change (e.g., “I want to become better in Spanish”), whereas striving for maintenance / avoidance of loss implies an orientation towards stability (e.g., “I want to maintain my Spanish at the current level

and not get worse”). Different to the distinction of gain vs. maintenance/loss-avoidance orientation, change as well as stability goal orientation might be approach as well as avoidance-motivated. In other words, change and stability goals can be either approach or avoidance oriented (see Table 6). When approaching a change goal, people are oriented towards a future state (e.g., “I want to become better”) whereas approaching a stability goal implies the wish to maintain an actual state (e.g., “I want to stay good”). Similarly, avoiding change is directed at an actual state (e.g., “I do not want to change”), whereas avoiding stability comprises a future state (e.g., “I do not want to become different”).

*Table 6:* Focus on future vs. actual state as a function of motivational system (approach vs. avoidance) and goal orientation (change vs. stability)

Motivational System	Goal Orientation	
	Change	Stability
Approach	Future State	Actual State
Avoidance	Actual State	Future State

Goal orientation towards stability or change is theoretically related to goal focus and thereby contributes to the hypothesized age-related differences in process and outcome focus. As we will elaborate below, we posit that a change goal orientation might be associated with a stronger outcome focus and stability goal orientation might be related to a stronger process focus.

One of the main reasons why change and stability goal orientation might contribute to goal focus is that they imply a different discrepancy between the actual and the desired state. The very definition of a change goal is that it entails a significant discrepancy between the actual and the desired state. In contrast, there is no discrepancy between the actual and the desired state in a stability goal – the desired state is to maintain this lack of a discrepancy. Feedback-loop models of goals (Carver & Scheier, 1998; Miller, Galanter, & Pribram, 1960) suggest that, as long as a



discrepancy reduction between the actual and desired state is intended and the outcome is not reached, a “tension state” towards the outcome exists, i.e., the cognitive accessibility of outcome-related information might be higher *before* than after goal fulfillment (see Förster, Liberman, & Friedman, 2007). In a change goal orientation the individual reduces discrepancy towards the outcome (“negative feedback loop”, Miller et al., 1960) and should therefore render the outcome more accessible than a person pursuing a stability goal orientation, where the outcome is reached.

Another line of argument for the association of change vs. stability orientation and process vs. outcome goal focus stems from the recently suggested temporal value asymmetry assumptions (Caruso, Gilbert, & Wilson, 2008). Accordingly, people value future events more than equivalent events in the equidistant past. Future outcomes in change goal orientation should therefore have a higher value than outcomes already reached in stability goal orientation. Consequently, change goal orientation should lead to a stronger focus on the outcome than stability goal orientation. Taken together, then, the larger discrepancy of the actual and desired state in a change goal should lead to a stronger outcome focus when compared to a stability goal. Conversely, stability goals should be associated with a process focus because there is no discrepancy between the desired and the actual state.

Furthermore, change and stability goal orientation might lead to different goal foci due to (1) how resource demanding the pursuit of a goal is, and (2) the frequency of means usage for change and stability goals over time.

*Ad (1): Resource demands.* Means might vary in different regards, as making one of them more desirable, e.g., for being less resource demanding than the other. Investing highly resource demanding means might be acceptable if they help achieving a certain goal fast and the investment of the means does not have to be repeated often. This is more likely to be the case in a change as compared to a stability goal that typically requires investment of resources as long as the goal itself exists (e.g., maintaining a certain diet in order to keep one’s weight stable).

Consequently, as means have to be selected more carefully when pursuing a stability goal, the focus should also be on means rather than the outcome of goal pursuit.

*Ad (2): Frequency of means usage.* Successful stabilization of achieved outcomes is often achieved by repeating already established goal-relevant behavior that helped attaining the now to-be-maintained state. Maintaining a certain state typically requires engaging in goal-relevant behaviors as long as people hold the respective goal. Stability goals (e.g., “I want to maintain my weight”) are typically not achieved at one specific point in time and therefore do not render themselves to one-shot goal pursuit. Stability goals, then, are more likely to be pursued for longer periods of time than change goals that typically specify a certain end point when the goal is achieved (e.g., “I want to lose 5 pounds”). Therefore, as goal pursuit stretches over a longer period of time, people are also like to use the means for goal pursuit more often than when they pursue change goals that are more likely to specify certain end points. Frequency here refers to the absolute number of times means are applied (not to the interval between using the means during a fixed time period). According to semantic memory theories (Collins & Loftus, 1975) or spreading activation models (Bower, 1981) the more recently or frequently a concept (such as a goal orientation) has been used in the past, the more often it is activated, and the more cognitively accessible it is. Therefore, if people use means more often in a stability as compared to a change goal orientation, therefore, means should also be more cognitively accessible.

*Adaptiveness of goal focus for change and stability goal orientation*

There might be an adaptive correspondence between mental representations of either means or outcomes and change or stability goal orientation. As the pursuit of change and stability goals pose different challenges to goal pursuit, process and outcome focus might be differentially adaptive. In particular, we posit that the challenge of a change goal lies in successfully reducing the discrepancy between the actual and desired state within a certain time (e.g., Carver & Scheier, 1998), which should require more intense and immediate effort mobilization, whereas the

challenge of pursuing a stability goal lies in maintaining it potentially endlessly, which should demand adaptive adjustment of means.

Let us first address the challenge of pursuing a change goal, namely to reduce efficiently the discrepancy between the actual and desired state. We maintain that an outcome focus might provide motivational resources helpful when people experience goal pursuit as effortful and demanding. As decision theories propose, outcomes are generally evaluated compared to the costs of attaining them, i.e., the effort invested in the pursuit of a goal (e.g., Kahneman & Tversky, 1979). Given the same costs, the higher (i.e., the more abstract) an outcome is set, the more it is perceived to be worth investing energy in it. Furthermore, Fujita, Trope, Liberman, and Levin-Sagi (2006) demonstrated that focusing on higher-order goals (i.e., outcomes) increases people's motivation and mobilizes efforts for outcome attainment: A focus on outcomes leads to a preference for delayed outcomes compared to immediate ones, greater physical endurance, more self-control and less positive evaluations of temptations that undermine self-control. Fujita and Han (2009) showed that changes in the evaluation of temptations depend on whether a goal is represented in more concrete or more abstract terms. This, in turn, might explain that an outcome focus can foster self-control when facing temptations. Additionally, Manderlink and Harackiewicz (1984) theorize that a focus on outcomes increases intrinsic motivation. Therefore, an outcome focus should be more likely than a process focus to mobilize motivational resources for optimal outcome attainment. Furthermore, the approach towards the desired outcome and the reduction of the actual-desired state discrepancy is evaluated and experienced as more positive the nearer one gets to the outcome (Carver & Scheier, 1982). In contrast, focusing on a discrepancy where none exists, as in the case of a stability goal, does not provide any further information regarding goal pursuit or potential for experiencing positive emotions.

Turning to stability goals, the main challenge is the length of goal pursuit. For instance, keeping one's weight is not reached at a certain point in time but instead requires constant adherence to a certain eating or exercising regimen. Because of the long-term aspect of stability

goal orientation, the means must have the potential to be used for as long as the goal is held. This is not necessarily true for change goals where, once a goal is reached, it is either abandoned (e.g., I want to pass this exam) or translated into a stability goal (e.g., “I want to lose 10 pounds,” once achieved, might turn into “I want to keep my weight down”). Because of the longer time frame of a stability goal, people have to pay more attention to how resource-demanding their means are. Taken together, this suggests that, when pursuing a change goal, an outcome focus might be more adaptive, whereas the pursuit of a stability goal should profit more from a process focus.

As was elaborated above, older adults report a stronger orientation towards the maintenance of functioning, whereas younger adults are more oriented towards achieving new gains. Taking a stability vs. change perspective, older adults should be more stability oriented, younger adults more change oriented. If, as we posit, stability orientation is related to a stronger process focus and change orientation to a stronger outcome focus, once again, we would once more predict that younger adults should focus more on the outcome of goal pursuit, whereas older adults should focus more on the process.

*Does process and outcome goal focus change with age?* A short-term longitudinal study by Freund et al. (2010, Study 3) provides first evidence for an age-related shift in primary goal focus. In this study, younger and older exercise beginners’ process and outcome focus were assessed using an exercise motivation scale. Outcome focus comprised such items as wanting to lose weight, becoming more physically attractive or improving one’s appearance in general. Process focus was operationalized as wanting to have fun, socializing with friends, or making new acquaintances. As expected, younger adults focused more on the outcome of their exercise goal, whereas older adults focused more on the process thereof. Moreover, outcome and process focus were differentially associated with goal-relevant exercise outcomes. Adults with a stronger process focus tended to experience a decrease in the distance to their goal over time and rated it as more attainable and important; they also reported higher goal involvement and satisfaction as

compared to adults with an outcome focus. One of the shortcomings of this study is that outcome and process focus were assessed indirectly via the motivation to exercise.

In a second study, we presented four goals (e.g., to quit smoking) to younger and older adults. Each goal was described by five process-related statements (e.g., throw away cigarettes) and five outcome-related statements (e.g., improve health). Participants were asked to select five out of these ten statements per goal. As hypothesized, younger but not older adults showed a significant preference for outcome-related descriptors, indicating their stronger outcome orientation. A third study investigated age-related differences in and affective consequences of goal focus. Both, younger and older adults, were to choose between two “thinking exercises”, one of them focusing on the desired outcomes of personal goals (i.e., outcome-related exercise), the other one focusing on means to pursue these personal goals (i.e., process-related exercise). Participants who selected the process-related exercise then had to list two successive means by which one could pursue the goal of having a good vacation. Participants who selected the outcome-related exercise had to list two successive desired outcomes of having a good vacation (see also Freitas, Gollwitzer, & Trope, 2004). Again, younger adults showed a preference for the outcome-focused exercise, whereas older adults showed no preference for either type. Affect measures were administered after conducting the exercises. A significant age by goal focus interaction indicated that older adults showed higher positive affect after the process-related exercise. Interestingly, younger adults showed more intense negative affect after conducting the outcome-focused exercise, which they had chosen more often. Even though younger adults appear to prefer an outcome focus, then, they experience more negative affect when adopting an outcome rather than a process focus.

### **Motivational phase and goal focus**

Integrating goal focus into the model of action phases by H. Heckhausen (1989) and the related model of cognitive mind-sets accompanying the different motivational phases

(Gollwitzer, 1990; Gollwitzer, Heckhausen, & Steller, 1990), we hypothesize that goal focus changes according to motivational phase.

In brief, H. Heckhausen distinguishes four consecutive phases in the motivational process<sup>14</sup>: In the first, *pre-decisional* phase, people deliberate about pros and cons of different goals, their short- and long-term consequences, as well as their subjective attainability. Once a decision is made, people no longer engage in comparing different options (e.g., Gollwitzer et al., 1990). In the *pre-actional* phase, they focus on formulating binding intentions and concrete action plans that are realized in the *actional* phase. In the final *post-actional* phase goal achievement is evaluated. Note that the sequence of motivational phases is idealized. Throughout the motivational process, people might step back, re-evaluate their goal (i.e., re-entering the pre-decisional phase), the means they employ (i.e., re-entering the pre-actional phase), maybe leading to changes in goal standards or the chosen means. The action phase model by H. Heckhausen proposes (and empirical studies provide evidence) that the proposed sequence is the most likely and prototypical one. Figure 2 summarizes the hypothesized goal focus during the goal process in the action phase model by H. Heckhausen (1989), augmented by the deadline model by J. Heckhausen (1999).

If a goal is not externally set (e.g., by teachers, parents, boss), people have to come to a decision if they want to adopt a certain goal or not. During this phase, the *pre-decisional phase*, we propose that people are likely to adopt an outcome focus. This is because during this phase, they deliberate about the advantages and disadvantages of one or more temporally distant outcomes. Weighing consequences of different options is likely to direct attention to abstract, global features of the goal rather than the concrete goal process. At this stage, people think about whether they want or like to attain something in general before engaging in laying out a roadmap

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<sup>14</sup> Note that, unlike H. Heckhausen (1989), we use the term “motivational phase” to refer to all phases from setting to attaining (or abandoning) a goal.

as to how to reach the goal. This is not to say, that considerations about whether one believes to have, in principle, good chances of achieving the goal, do not play a role. They clearly do, as

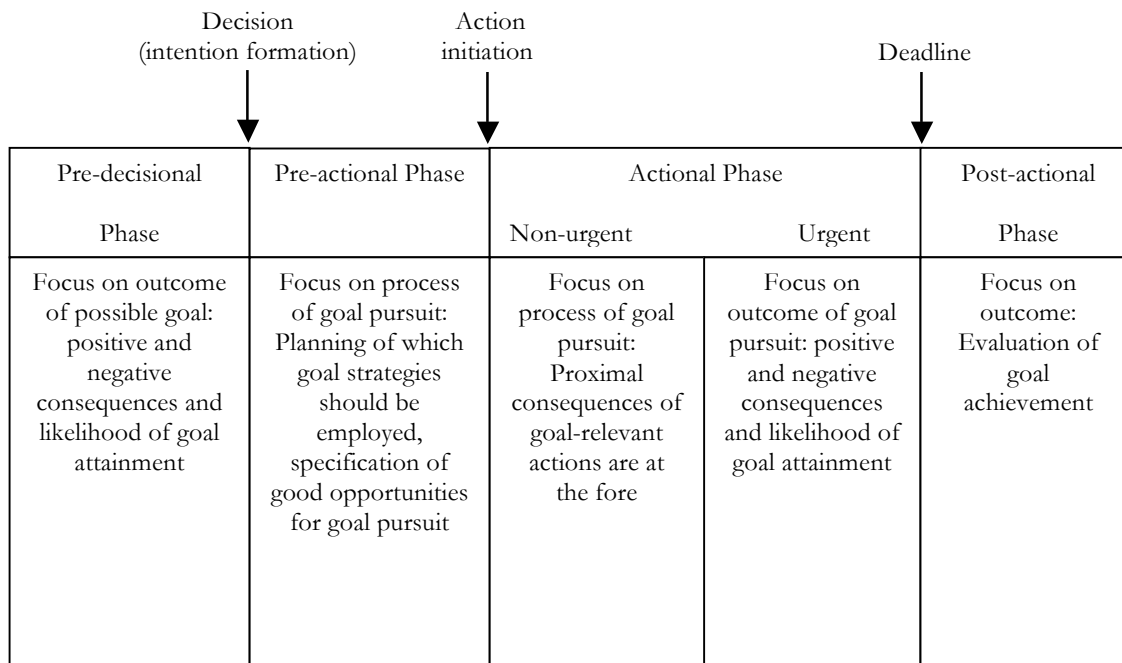


Figure 5: Hypothesized goal focus across motivational phases

research on goal setting shows (for an overview of this literature, see H. Heckhausen, 1989). As the literature in the context of bounded rationality and the use of heuristics for making decisions suggests, however, people do not typically have elaborate lists in mind integrating the various goal-relevant means, weighted by subjective likelihood of attaining each step (Gigerenzer, Todd, & the ABC research group, 1999; see also H. Heckhausen, 1989). Even if all the necessary information were available, such an approach would overburden cognitive capacities and might not even lead to better decisions (Gigerenzer et al., 1999). Therefore, focusing on the outcome and the value attached to the consequences of a potential goal before making a decision seems more likely *and* more adaptive than taking a detailed stock of the necessary means attached to the different outcomes also into account. In fact, H. Heckhausen and Gollwitzer (1987) showed that people focus more on the values of the outcome than on strategies of goal pursuit during the pre-decisional phase.

If a goal is not self-selected but instead externally imposed (and accepted as a goal by the individual), the pre-decisional phase is not relevant and people move directly to the *pre-actional phase* which describes the phase after having committed to a goal and before actually engaging in goal-relevant actions. In the pre-actional phase, people plan the implementation of intentions as to how, when, and where to start goal-relevant actions and means. If the means of goal pursuit are well established and highly routinized, it is likely that people will immediately proceed to implementing goal-relevant actions, sometimes even in an automatic way, as Bargh and Gollwitzer (1994) posit in their automotive theory of goal pursuit. If, however, the means are not yet known and routinized, the focus is likely to lie on finding out the best way to pursue the goal (see also Zimmerman & Kitsantas, 1997; 1999). In line with this, H. Heckhausen and Gollwitzer (1987) demonstrated that the post-decisional phase is associated with elaboration of plans and strategies of how to implement goal pursuit. Findings on the *implementational mind-set* are highly compatible with the assumption of a predominant process focus during this motivational phase. Moreover, in a number of studies, Gollwitzer and his colleagues (for an overview see Gollwitzer & Sheeran, 2006) showed repeatedly and consistently that clear and strong implementation intentions contribute to goal achievement. Implementation intentions specify goal-related means and actions, situations in which to apply those means, and also the right timing of acting on a given goal. Moreover, implementation intentions have important cognitive effects (i.e., implemental mind-set): They focus attention on goal-relevant information and ward off distractions (including questioning the value of the selected goal), they heighten the accessibility of situational cues allowing goal-related actions (thereby enhancing the likelihood of seizing the right moment and opportunity), and lead to being particularly optimistic about achieving the goal. All of these characteristics of planning enhance the likelihood of actually initiating and completing intended goal-related actions or applying goal-related means (Gollwitzer & Brandstätter, 1997). Taken together, the literature suggests that during the pre-actional phase, people focus on the actual *process* of goal pursuit rather than the outcome.



In the *actional phase*, the primary task is to invest goal-relevant means and engage in goal-relevant actions in the interest of goal achievement. H. Heckhausen and colleagues claim that a focus on the outcome on a rather abstract level of cognitive representation might be predominant and adaptive during this phase. In contrast, we posit that focusing on the outcome might distract from good opportunities to implement goal-relevant plans and might thereby actually hinder goal achievement. Particularly when long-term goals are pursued that require maintenance of goal-relevant actions over an extended period of time, focusing on the activities related to goal pursuit (rather than the negative discrepancy to a desired outcome) should help maintaining motivation even in the face of hindrances or setbacks (see Kuhl & Beckmann, 1994). This should be the case because, if the very process of goal pursuit is in the foreground, the distance to the outcome becomes less salient. For instance, when the goal is to lose weight and the goal-relevant means is exercising regularly, a lack of weight loss over a certain period of time is less likely to discourage from exercising if the focus is on jogging every morning. If an outcome orientation prevails, the person might give up exercising if no weight reduction is seen within a certain period of time. This might also be why many weight loss programs advise not to get on the scale too often.

The hypothesis of a predominant focus on goal pursuit during the actional phase is also in line with research on automatic goal pursuit. According to the automatic model by Bargh and Gollwitzer (1994), the repeated activation of a goal in a certain situation leads to an association of the respective goal and situational cues. Such situational features can then automatically trigger goal-relevant actions without being consciously aware of the respective goal (Bargh, & Ferguson, 2000). This suggests that, during the actional phase, there is not even conscious awareness of the outcome in order to pursue a goal. It might even happen that – temporarily or permanently – the process itself takes over as the goal and the outcome is either regarded as relatively unimportant or even abandoned as irrelevant (e.g., jogging every morning for 45 minutes becomes a goal and techniques are acquired to improve running performance, whereas losing weight might be seen as

nice side-effect of jogging but no longer as the goal). As these examples show, means and ends can change their status during the motivational process (Kruglanski, 1996). Means sometimes become outcomes. Attention then shifts to the subordinate means to achieve the new goal (formerly known as means).

A different situation arises when a (self-set or imposed) deadline is approaching (J. Heckhausen, 1999). In this case the outcome will again become more salient. A deadline (e.g., losing 3 pounds until the night of the high school prom a week from now) revives the importance of the outcome and decreases the importance of the valence of the process. In such cases, the most effective (and not necessarily the most enjoyable) way of attaining one's goal needs to be identified and implemented so as to reach it in time. Closely monitoring the distance to an outcome becomes adaptive and adjusting means of goal pursuit accordingly is required (e.g., Schmitz & Wiese, 1999).

If the means for achieving a goal are not positively valued, even if the outcome is, people are tempted to procrastinate and not engage in goal-relevant activities. In this case, a deadline and the perceived negative consequences of missing it (i.e., not achieving the outcome) serves as an incentive to get to work. The valence of the more abstract outcome representation (i.e., the positive valence of achieving the outcome, or the negative valence of failure) is helpful for overriding the negative valence of the concrete goal-relevant means. In fact, research suggests that deadlines increase performance and goal attainment and, moreover, that people even self-impose binding deadlines to counteract procrastination (e.g., Ariely & Wertenbroch, 2002). Thus, people might use deadlines to induce a shift from process to outcome focus, thereby motivating themselves to strive for the positively valued goal instead of focusing on negative aspects of goal pursuit. Note, that not only achievement-related goals can have such deadlines but they can be applied to other life domains as well. An example of a (external) developmental deadline in the family domain is menopause for reproduction in women.

Adopting an outcome goal when a deadline is looming might, on the one hand, help to mobilize increased efforts of goal pursuit and attain a goal within a certain time frame. On the other hand, however, outcome focus might also hinder flexible adjustment of means and emphasize the importance of investing maximum effort over efficient use of goal pursuit strategies (Schmitz & Wiese, 1999). Hence, if a deadline is introduced too early in the motivational process, i.e., when the most adaptive means or strategies of pursuing the goal are not yet established, goal attainment might come at a relatively high cost or people might not live up to their optimal performance level (see also Ariely & Wertenbroch, 2002). In cases where no deadline is set people are expected not to undergo a shift from process to outcome focus during goal pursuit. The same holds true for goals consisting of a state to be reached and maintained (e.g., “I want to be happy.”) rather than an endpoint (e.g., “I want to get married.”). State goals do not have clear endpoints but instead stretch over an extended period of time. As continued engagement in goal pursuit is needed for such goals, they should be generally more conducive to process focus. This contrasts with goals that specify a specific outcome that can be reached at a certain point in time. Upon reaching such goals – or after deciding to give it up (e.g., because a deadline has passed) – people enter the post-actional phase, in which they evaluate the means and the degree to which they reached the outcome. If the goal will have to be reached again (e.g., taking an exam in school), it is likely that people are motivated to evaluate the quality of the means in order to be able to optimize goal pursuit in the next round (i.e., maintain a focus on processes for some time). With increasing temporal distance, however, people will focus primarily on the outcome (Trope & Liberman, 2003).

Taken together, goal focus is proposed to change relative salience depending on motivational phase. During the pre-decisional and, again, when urgency in attaining the goal is experienced, outcome focus should be predominant. During the pre-actional and non-urgent actional phase, process focus is expected to be more salient.

### **Consequences of goal focus after failure**

After having discussed antecedents of goal focus related to age, resources, time perspective, goal orientation and motivational phase, we now turn to the *consequences* of goal focus when people have to cope with failure. There are many typical situations in which goal pursuit is hampered by setbacks or failure: Dieters are frustrated when their weight goes up instead of down, students fail to pass their exams, and sportsmen do not win a competition. As setbacks and failures are a major threat to future persistence and subjective well-being (Carver & Scheier, 1990; Pomerantz et al., 2000), psychological research has long been interested in how people cope with them: Under which conditions is a person persistent and substitutes their means of goal pursuit? When will someone give up his/her goal and decide to head for other desirable outcomes instead? One prominent determinant of affective and behavioral consequences to failure is attribution to, e.g., internal or external, stable or instable, global or unspecific causes (Abramson et al., 1978). We argue that goal focus is another important determinant of affective and behavioral reactions to failure as it might influence whether the inappropriateness of the means or the difficulty of attaining the outcome are in the foreground of failure attributions.

*Attributions to the means vs. the outcome.* Feedback is essential to evaluate progress towards a desired outcome (e.g., Carver & Scheier, 1981, 1982). Such feedback can contain components that are related to the means and to the outcome (Earley et al., 1990). Not attaining the desired outcome (e.g., losing weight) can be attributed to either the wrong means (e.g., “exercising does not contribute to weight loss”) or to the outcome (e.g., “losing weight is impossible as it is genetically fixed”; see also Burnette, 2010). Whether failure is attributed to the means or the outcome should partly depend on goal focus. Thinking about means (process focus) should be associated with the cognitive accessibility of these means, whereas thinking about outcomes (outcome focus) should be associated with the cognitive accessibility of these outcomes. Conversely, as highly accessible goals or constructs influence information processing (e.g., Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Bargh & Pratto, 1986; Förster et al., 2005;

Higgins, Bargh, & Lombardi, 1985), a person who primarily focuses on means will be more likely to attribute setbacks to the inappropriateness of the means (e.g., “This diet does not work for me”), whereas a person who primarily focuses on the outcome will be more likely to attribute failure to the difficulty of achieving the outcome (“It is difficult to reduce my weight”). In other words: Beaming a flashlight on the means of goal pursuit will more likely also highlight the blocked path, whereas beaming it on the desired outcomes will highlight the blocked outcome. Failure, then, should be attributed to the means in a process focus and to the outcome in an outcome focus.

*Behavioral consequences of goal focus after failure.* Attributions of failure to the means or the outcome should have different effects on subsequent behavior. After experiencing a failure, there are different behavioral options: Means that are thwarted or resulted in failure can often be substituted by others (equifinality; Kruglanski, 1996; Kruglanski et al. 2002). Conversely, often different outcomes can be attained via the same means (multifinality; Kruglanski & Jaffe, 1988; Kruglanski et al., 2002). In a process focus, when the means of goal pursuit are identified as problematic and inappropriate, means substitution (i.e., compensation; see Freund & Baltes, 2000, 2002) is the self-evident behavioral reaction. In contrast, in an outcome focus and when the desired outcome is perceived as blocked, it is more straightforward to switch to another desirable outcome, i.e., disengage from the goal at hand and select a new one (i.e., loss-based selection; Freund & Baltes, 2000, 2002).

In line with this rationale, some researchers have also argued that so-called “what the hell” cognitions result from identifying behaviors on higher, more abstract levels (Cochran & Tesser, 1996). “What the hell” cognitions typically occur in dieters. After having failed to resist a temptation (e.g., a piece of cake), they interrupt their dieting for a day or even completely disengage from their weight loss goal. As a consequence, they show disinhibited eating (e.g., more pieces of cake; Polivy & Herman, 1985). This breakdown of self-regulation might be caused by the attribution of their failure to the desired outcome (“I am not successful in reducing my

weight”). Perceiving their goal as blocked, they disengage from it and switch to the tangible goal of eating enjoyment (for a similar argumentation see also Stroebe et al., 2008). In fact, we have shown that dieters who focus on a more abstract and outcome-related level of their goal (weight reduction, improving one’s appearance) show more disinhibited eating after failure than dieters who focus on a more concrete process-related level (the way they diet, resist temptations; Hennecke & Freund, in revision). In addition, a recent study by Burnette (2010) has shown that dieters who might tend to attribute failure to the outcome of dieting, as they believe body weight to be fixed (entity theorists) rather than malleable by the use of appropriate means (incremental theorists) report less persistence following setbacks. Moreover, findings of our own self-report study (Hennecke & Freund, in revision) also supported the predicted link between goal focus and means substitution vs. loss-based selection after failure in other goal domains. Participants were asked to name two personal goals and indicate how much they think about the means of goal pursuit (process focus) and about the desired outcomes (outcome focus). As expected, process focus was strongly positively related to means substitution as opposed to loss-based selection. Outcome focus was slightly negatively related to means substitution; hence, it had a positive impact on the loss-based selection of new outcomes after failure.

*Affective consequences of goal focus after failure.* What are the affective consequences of process and outcome focus when people encounter failure? According to Carver and Scheier (e.g., 1981), feelings arise as a consequence of an automatic feedback process. The feedback process continually checks how well one’s actions reduce the discrepancy between the actual and a desired state. If goal progress is below a criterion that refers to an acceptable rate of discrepancy reduction, negative affect arises. If goal progress exceeds the criterion, positive affect arises. If it is identical with the criterion, no affect arises (Carver, 2004). Failure of goal pursuit can be defined as a progress rate below this criterion or even stagnation. Accordingly, failure generally elicits negative affect (see also Hsee & Abelson, 1991). We propose that, especially when goals are difficult to attain and goal pursuit is hampered by setbacks, focusing on and valuing primarily

the outcome has negative consequences as it makes the discrepancy between the actual and the desired state more salient.

A second explanation for the detrimental effects of outcome focus on affective well-being is based on the hierarchic organization of goals and goal-directed behavior (e.g., Carver & Scheier, 1982, 1990; Emmons, 1996; Vallacher & Wegner, 1985). Means are often referred to as subgoals that serve the attainment of more abstract, superordinate goals, the respective outcomes. As goals that are placed higher in a personal goal hierarchy are more important and central to the self (Austin & Vancouver, 1996; Boden, 1973), outcomes, by definition, should be more important than their respective subgoals or means. Martin and Tesser (1989) also assume that the higher a goal in the hierarchy, the more likely it is that a threat to this goal will elicit rumination, a tendency to carry negative thoughts and feelings after being exposed to unpleasant events. Taken together, as a means is subordinate to its desired outcome, a threat to a means should be less severe than a threat to an outcome. Houser-Marko and Sheldon (2008) have supported this hypothesis when showing that failure feedback has stronger negative effects on mood when it alludes to the process (in their terms: primary goal level) as compared to the outcome (in their terms: sub-goal level). Moreover, Emmons (1992) demonstrated that people who focus on concrete goals show less depressive symptoms than people whose goals are rather abstract. Our own research supports our assumptions as well: We have found that dieters who attribute their failure on the level of means show higher positive affect than dieters who attribute their failure to the level of outcomes (Hennecke & Freund, in revision).

In addition to these direct effects of goal focus on affect, an indirect effect might result from the behavioral outcomes of each focus. When goals are higher in the goal hierarchy than their subordinate means, disengaging from a goal to switch to another (loss-based selection) should impede affective well-being stronger than disengaging from a means and switching to another (means substitution). In fact, we have found that means substitution (as opposed to loss-based selection) is positively related to affective well-being (Hennecke & Freund, in revision).

In sum, then, a process focus might be generally more adaptive after failure because it should lead to attributions of failure to the means rather than to the desired outcome. This, in turn, should foster the substituting of means rather than the loss-based selection of a new outcome. Finally, focusing on means has positive effects on affective reactions to failure, whereas focusing on the outcome should make the discrepancy between the actual and the desired state even more salient.

### **Conclusion**

Goals have wonderful qualities: They motivate behavior, help us organize behavior into action sequences over time and situations, and thus provide our lives with direction and meaning. Although we wholeheartedly agree with this assessment, we would like to distinguish at least two goal dimensions that modulate the adaptiveness of goals. Depending on the availability of resources, it might be better to orient one's goals towards gains, maintenance, or the avoidance of loss. Goal orientation, in turn, might affect goal focus on the process or the outcome of goal pursuit. We argued that a gain (change) orientation is likely to be related to an outcome focus, whereas maintenance (stability) orientation is likely to be related to a process focus. Moreover, we elaborated that the motivational phase might influence the goal focus (during the predecisional phase and close to a deadline, an outcome focus is more likely to occur, whereas during the actional phase a process focus should prevail). Importantly, regarding the consequences of goal focus, we argued that process focus might lead to higher persistence and and less negative affect when encountering difficulties during goal pursuit. Research on goal focus is just at the beginning of empirically testing these hypotheses. Initial results, however, are largely supportive of the ideas presented here. Future research will have to prove the incremental validity of goal focus over other constructs such as intrinsic and extrinsic motivation.



**PART IV: AGE-RELATED DIFFERENCES IN OUTCOME AND PROCESS GOAL  
FOCUS**

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### **Abstract**

Three studies report initial findings on age-related differences in goal focus. Study 1 compared younger ( $n = 23$ , 19-25 years) to older ( $n = 20$ , 57-78 years) adults regarding their preference for representations of goals in terms of the means (process focus) or the associated outcomes (outcome focus). As expected, older adults chose process descriptors of goals more frequently than younger adults. Study 2 investigated the emotional consequences of goal focus. Whereas younger adults ( $n = 49$ , 18-25 years) reported higher negative affect when they focused on the outcomes of a goal, older adults ( $n = 40$ , 60-88 years) reported higher positive affect when they focused on the process. Study 3, a 4-month longitudinal study, applied the distinction between process and outcome focus to the context of a personal goal in everyday life (starting to exercise). Older adults ( $n = 46$ , 55-78 years) reported having a stronger process focus than younger adults ( $n = 55$ , 19-25 years). Again, older adults were more likely to adopt a process than an outcome focus. For both age groups, process focus predicted positive goal-related development and affective well-being. In contrast, outcome focus was either not or negatively related to these outcomes.

*Keywords:* Goal focus, process, outcome, age differences, motivation

## Introduction

Laypeople and motivation researchers agree that setting and pursuing goals has positive consequences. Goals give life meaning, direction, and contribute to happiness and well-being (e.g., Emmons, 1996; Klinger, 1977; Little, 1989). As Albert Einstein said, “If you want to live a happy life, tie it to a goal.” This view emphasizes the importance of linking one’s life and actions to the achievement of certain *outcomes*. However, it stands in contrast to an equally popular view emphasizing the *process* of goal pursuit. As a Buddhist proverb says, “The path is the goal.” The research reported here revolves around this distinction between the process and outcome focus of personal goals. It addresses two central research questions: (a) what factors determine whether people focus more on the outcome of a goal or on the process of pursuing a goal? And (b) are process and outcome focus equally beneficial with respect to goal achievement?

Goals have been defined as cognitive representations of personally desired (or dreaded) states to be approached or avoided (e.g., Kruglanski, 1996), such as becoming a nurse or not becoming like one’s parents. Goals direct attention, motivate and organize behavior over time and across situations, and provide a sense of direction and purpose in life (Freund, 2006a). Moreover, research suggests that goal pursuit enhances performance (e.g., Austin & Vancouver, 1996; Emmons, 1996; Freund, 2006a).

Not all goals, however, are created equal (Ryan et al., 1996). They may differ in content, concreteness, difficulty, time frame, gain and loss orientation, and so forth (e.g., Little, 1989; Locke & Latham, 2002; Wiese & Freund, 2005). There is abundant empirical evidence that such characteristics affect the adaptiveness of goals (e.g., Freund, 2006b; Freund & Ebner, 2005; Little, 1989; Locke & Latham, 2002; Riediger & Freund, 2004; Wiese & Freund, 2005). Comparatively little, however, is known about age-related differences in the characteristics and functions of personal goals. This is surprising given the increasing interest in the active role that adults play in shaping their development (e.g., Baltes et al., 2006; Brandtstädter, 1998; Freund et al., 1999; Lerner & Busch-Rossnagel, 1981) and recent evidence suggesting that personal goals may be

among the phenomena that show positive development throughout adulthood (Bauer & McAdams, 2004; Riediger, Freund, & Baltes, 2005; Sheldon & Kasser, 2001). In the present research, we took a developmental perspective to investigate adult age-related differences in outcome and process goal focus.

In Gestalt psychological terms, goal focus refers to those aspects of a goal that form a “figure” because they are more salient. Various dimensions of goal focus have been distinguished, such as gain–loss (e.g., Freund & Ebner, 2005), intrinsic–extrinsic (e.g., Deci et al., 1999; Krapp, 2005), and mastery–performance (e.g., Dweck & Leggett, 1988). The present research centered on the distinction between outcome and process goal focus (e.g., Sansone & Thoman, 2005). Outcome focus refers to the cognitive representation of a goal primarily in terms of the outcome of goal pursuit, that is, the short- or long-term consequences of goal pursuit. Process focus refers to the cognitive representation of a goal primarily in terms of the process of goal pursuit, that is the means of and one’s investment in goal attainment. For instance, one might represent the goal to start exercising regularly primarily in terms of its consequences (i.e., the outcome) such as weight loss or improvement in health – or primarily in terms of aspects of the goal-pursuit process, for example, the specific type of exercise (e.g., aerobics or jogging) or with whom one wants to exercise. Most goals are likely represented to some degree in terms of both, means and ends, process and outcome, but people may differ with respect to goal focus preference. The questions we address in this paper concern whether there are systematic individual differences in preference for outcome and process focus and whether goal focus is related to measures of goal engagement, goal achievement, and, more generally, adaptiveness in terms of affective wellbeing.

Below, we will specify the concept of process/outcome goal focus by distinguishing it from two related constructs, namely extrinsic/intrinsic motivation and performance/mastery orientation. Following that, we will discuss the theoretical background of our central predictions concerning age-related differences in, and the adaptiveness of, process and outcome focus. We

will then introduce a specific goal context for one of the studies, namely, starting to exercise regularly.

*Linking outcome and process focus to the concept of extrinsic and intrinsic motivation*

Extrinsic motivation has been defined by a focus on the external consequences of goal achievement (e.g., external rewards for achieving a certain goal), whereas intrinsic motivation has been characterized by a focus on the task at hand (e.g., enjoyment of or interest in the goal relevant activity). As compared to extrinsic motivation, intrinsic motivation is associated with voluntary involvement, more interest, and higher persistence in a task (e.g., Deci et al., 1999; Krapp, 2005; Lepper, 1981). Intrinsic motivation implies that a person focuses on the satisfaction derived from an activity rather than on the external consequences of goal achievement. For instance, when one's goal is to paint a picture, either the amount of money the picture will bring in at the next exhibition (i.e., extrinsic motivation) or the enjoyment of and interest in the activity of painting (i.e., intrinsic motivation) could be in the foreground. Engaging in goal pursuit for tangible, external rewards has been shown to undermine intrinsic motivation (Deci et al., 1999).

At first glance, the definitions of intrinsic and extrinsic motivation overlap those of process and outcome focus. Intrinsic motivation entails a focus on the process, extrinsic motivation on the consequences of attaining a certain outcome. The opposite, however, is not true: Both process and outcome focus can be either extrinsically or intrinsically motivated. For example, a person might focus on the *outcome* of goal pursuit (e.g., a beautiful painting) for an intrinsically motivated goal (e.g., aesthetic enjoyment) that was set autonomously and will have no further consequences such as praise or tangible rewards. Similarly, a person might focus on the *process* of goal pursuit (e.g., painting) because she/he is externally motivated to do so (e.g., through teachers' praise for her/his talent and perseverance).

*Linking outcome and process focus to the concept of performance and mastery orientation*

The literature on performance and mastery orientation is also relevant to the concept of process and outcome goal focus. Dweck (e.g., Dweck & Leggett, 1988) defined "performance

goal orientation” as a focus on how well one is doing (particularly as compared to others) and “mastery goal orientation” as a focus on learning and mastering a skill. She traced these two types of goal orientation back to beliefs about skills as fixed (i.e., an entity) or malleable (i.e., incremental), respectively. In the first case (entity theory), performance is seen as an indicator of underlying ability and provides feedback about an unchanging trait. In the latter case (incremental theory), feedback is a means of improving one’s skill level. A number of studies in educational settings have shown that setting mastery goals promotes interest in and enjoyment of goal pursuit, but that performance goals are associated with a higher level of performance (e.g., Harackiewicz et al., 2000; see Dweck & Molden, 2005, for a recent review). In studies of organizational behavior, however, VandeWalle and colleagues have shown a positive link between mastery goals (in this context often labelled “learning” goals) and the successful acquisition of new skills, feedback seeking, and performance (e.g., VandeWalle, 2001; VandeWalle et al., 1999).

Seijts and Latham (2005) posited that the adaptiveness of mastery/ learning and performance orientation depends on whether the means and strategies of goal pursuit have already been learned and mastered: If they have not, learning goals should enhance performance because attention is focused on the means of goal pursuit while focusing on performance might actually distract and hinder successful goal-pursuit. In a similar vein, and using the terminology of process and outcome focus, Zimmerman and Kitsantas (1997, 1999) point out that, when learning to master a new task, people are more likely to adopt a process focus, defined by these authors as a focus on the acquisition of (strategic) skills (i.e., mastering the various elements and steps of a complex skill such as writing or dart throwing) or, in other words, on the means for achieving a given outcome. Outcome focus, in contrast, presupposes mastery of the different elements of which a complex skill is comprised and denotes a focus on the actual outcome (i.e., performance level). In line with Seijts and Latham (2005), Zimmerman and Kitsantas (1997, 1999) found that a focus on the acquisition of skills and means (i.e., process focus) is beneficial

when learning a new skill whereas outcome focus enhances performance when the means need to be implemented as an integrated whole in the service of goal attainment.

In short, there are specific manifestations of outcome and process goal focus that have received considerable attention in educational and organizational settings. Currently, however, relatively little is known about the relevance of process and outcome goal focus in other domains. In addition, to our knowledge, no research has ever investigated the possibility of age-related differences in adults with respect to process and outcome goal focus. The present study aimed to extend previous research in these two respects by investigating outcome and process focus in the context of the goal to start exercising regularly in younger as compared to older adults.

### **A developmental perspective on goal focus**

We posit that two factors associated with chronological age might contribute to the adoption of process versus outcome goal focus. Goals related to a temporally enduring state or to the maintenance of performance (e.g., “I want to stay healthy”) require constant work on the goal and might thereby lend themselves more easily to a process focus than goals involving the achievement of new outcomes or benefits (e.g., “I want to be able to fit into this dress and wear it to the prom”). Similarly, as elaborated by construal level theory (Trope & Liberman, 2003), goals that are temporally distant are more likely to invoke an outcome focus, whereas those that are temporally closer should lead to a stronger process focus. Preference for an outcome or process goal focus might thus vary depending on (a) the tendency to frame goals primarily in terms of acquiring new benefits versus maintaining the status quo and (b) their time perspective, both of which are related to age. With increasing age, time perspective decreases (Lang & Carstensen, 2002) and framing goals in terms of maintenance increases (Ebner et al., 2006). On the basis of these findings, we hypothesized that process focus would increase and outcome focus would decrease during adulthood.

Alternatively, however, one could also formulate the opposite hypothesis: Given that the future time perspective of older adults is shorter, they might find it more important to focus on

tangible outcomes than on the continuous process of working towards a goal. Another argument for this alternative prediction comes from organizational research, which suggests that the adoption and adaptiveness of goal focus depends on skill level (Zimmerman & Kitsantas, 1997, 1999), which, in turn, is often associated with age. In many domains of life, young adults are still in the process of acquiring the means and skills relevant for goal pursuit, such as the skills or knowledge needed in the professional/work domain or that needed to establish a long-term partnership and family. This might force young adults to focus more closely on the acquisition of skills or the process of goal pursuit. Middle-aged and older adults are more likely to have acquired most of the skills necessary to pursue their goals in both the work and the social domain and, thus, may be more likely to focus on the outcome of goal pursuit. Moreover, as Kanfer and Ackerman (2004) pointed out, skills can also be defined in terms of the balance between investment of resources and payoff. In the context of work-related motivational development during adulthood, they argued that the payoff for resource investment decreases with age, leading younger adults to be more focused on the process of resource investment and older adults to be more focused on the outcome.

In sum, different literatures support opposing hypotheses regarding age-related differences in the extent of process and outcome goal focus. One purpose of the present study was to clarify which of these two alternative hypotheses is empirically supported in the context of the goal to start exercising regularly.

### **Adaptiveness of process and outcome focus**

As mentioned above, in the skill-acquisition domain, the adaptiveness of goal focus has been proposed to vary with learning phase. Seijts and Latham (2005) posited that as long as the means and strategies of goal pursuit are not (yet) known or mastered, learning goals (as a manifestation of a process goal focus) should enhance performance because attention is focused on the means of goal pursuit, while focusing on performance (as a manifestation of outcome goal focus) might distract and thus hinder successful goal pursuit (see also Zimmerman & Kitsantas,



1999). But how do outcome and process focus affect goal pursuit and subjective well-being in other goal domains that are not related to the acquisition of new skills? One could argue that a strong and pervasive outcome focus fosters performance and goal achievement by providing clear criteria for judging whether the means are appropriate for achieving a given goal (Carver & Scheier, 1995). However, we propose that, in the long run, outcome focus might be detrimental to goal engagement and subjective well-being because outcome orientation focuses attention on the discrepancy between the actual and the goal state (outcome), which might result in negative affect and self-regard. Moreover, achieving a desired outcome often does not result in enduring satisfaction because there are always new (better) desired outcomes (e.g., a fancier car, a bigger house). Thus, outcome focus might lead to a “treadmill effect” in that satisfaction related to the attainment of one goal is soon offset by the need to achieve new goals (e.g., Loewenstein & Schkade, 1999).

In contrast, process focus should promote more enduring engagement in goal pursuit, goal satisfaction, and subjective well-being when the very pursuit of a goal is positively valued. Process focus might offer opportunities for positive rewards throughout the entire process of goal pursuit and setbacks might therefore be experienced as less detrimental and frustrating (Locke & Latham, 2002).

We therefore hypothesized that, independent of a person’s age, outcome focus would be related to lower levels of involvement and satisfaction with a goal as well as with lower optimism about reaching the goal, whereas process focus would be associated with higher levels of involvement and satisfaction with a goal as well as optimism about reaching the goal.

### **Overview of the studies**

We conducted three studies to investigate the proposed age-related differences in goal focus in younger and older adults. Studies 1 and 2 were Internet-based studies assessing the *preference* for process versus outcome focus. Study 2 also included a “thinking exercise”, which focused attention either on the process or the outcome of pursuing a goal and a subsequent

measure of positive and negative affect, which allowed us to test for age differences in the consequences of goal focus. Study 3 addressed the question of age-related differences in goal focus in an everyday context, namely, in the context of pursuing the goal to start exercising regularly. We chose this context because starting to exercise regularly is a relatively frequent goal that is potentially relevant for both younger and older adults and thus suitable for a comparison of age groups (which can be difficult because younger and older adults often differ in the goals they pursue). Furthermore, process and outcome focus can be assessed easily by means of an evaluation of the participants' reasons for exercising. Individuals might focus primarily on the outcomes associated with regular exercise (e.g., more defined muscles, weight loss) or they might focus more on the activities and means involved in the process of exercising (e.g., enjoying the physical activity, getting together with friends to exercise).

### **Study 1: Preference for process versus outcome focus**

The main purpose of Study 1 was to test the hypothesis that there are age-related differences in goal focus. To our knowledge, no prior research has directly assessed goal focus. Therefore, in Study 1, we also aimed to develop a method of assessing goal focus.

#### **Method**

*Sample.* Participants were recruited via advertisements in Swiss Internet forums (e.g. seniors' forums, University of Zurich students' forums). Advertisements included a link to an online questionnaire, which was created and published using an online questionnaire tool (SurveyMonkey; see [www.surveymonkey.com](http://www.surveymonkey.com)). The sample consisted of 23 young adults (19-25 years,  $M = 22.12$ ,  $SD = 0.49$ ; 75 % female; all students) and 20 older adults (57-78 years,  $M = 65.90$ ,  $SD = 6.49$ ; 65 % female; 50 % with a college degree, 15 % retired).

*Measures.* Participants first responded to basic demographic questions about their age, sex, and occupational status, and then to items on a measure of goal focus. This measure was modeled after Vallacher and Wegner's (1989) questionnaire, which assesses level of action identification. More specifically, four goals (e.g., to quit smoking) were presented to participants,

one goal at a time. Each goal was described by ten statements, half of which described the goal in terms of a means of achieving it (i.e., process-related statements, e.g., throw away cigarettes, spend time with non-smokers), the other half in terms of outcomes (i.e., outcome-related statements, e.g., save money, improve health). For each goal, participants were to select five of the ten statements that, in their opinion, best described the goal. The dependent variable was participants' process orientation as indexed by the mean number of process-related statements selected per goal (maximum 5) over the four goals ( $M = 2.12$ ,  $SD = 1.12$ ). Cronbach's  $\alpha$  for number of process-related statements selected across the four goals was .79.

### Results and discussion

As predicted, the older adults showed greater process orientation (and, thus, less outcome orientation) than the younger adults did (see Figure 4). In addition, whereas the younger adults selected more outcome- than process-oriented goal descriptions, the older adults showed no such tendency. Univariate ANOVA revealed a significant main effect of age group on the mean number of process-related statements selected per goal ( $F(1, 41) = 5.41$ ,  $p = .025$ ).

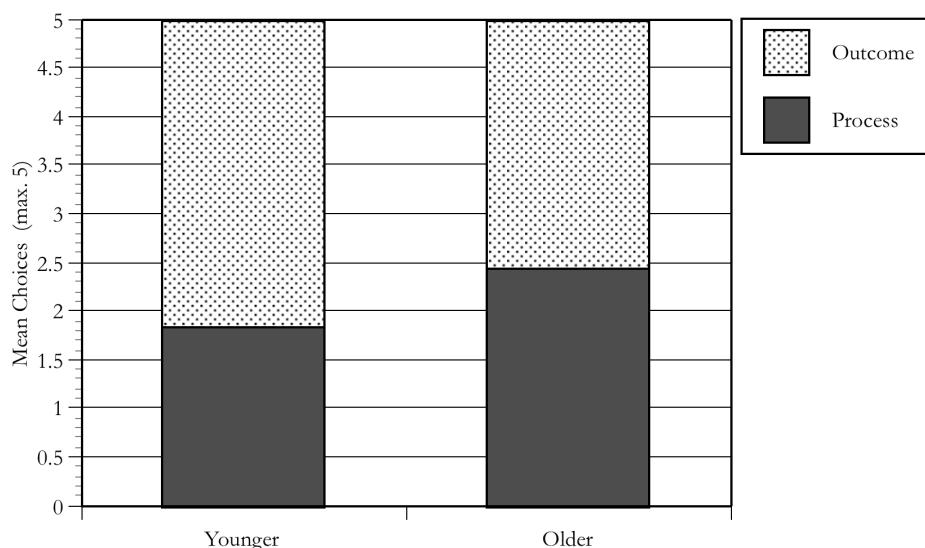


Figure 6: Selected goal focus as a function of age (means, study 1)

The results of Study 1 provide initial evidence for age-related differences in preference for representing goals in terms of the goal-pursuit process as opposed to the outcome. Unlike older adults, younger adults showed a clear preference for outcome-related goal descriptions. As this is the first study addressing the question of age-related differences in goal focus, this finding needs to be replicated in order to ensure its robustness. Moreover, Study 1 did not address the question of the possible consequences of adopting a process or an outcome focus. Therefore, Study 2 included indicators of affective well-being after participants had focused their attention on the goal-pursuit process versus the outcome.

### **Study 2: Effects of goal focus on positive and negative affect**

#### **Method**

*Procedure.* Participants were recruited via advertisements on various German and Swiss web pages and asked to follow the link to an online questionnaire. In the questionnaire, participants first responded to basic demographic questions concerning their age, sex, and occupational status, and then, on a 7-point scale, to two items concerning their general life satisfaction. Afterwards, they selected one of two “thinking exercises”, one focusing on the means (process choice), one focusing on the consequences of certain actions (outcome choice; see the Appendix D for English translation of German language instructions). Participants subsequently filled out a questionnaire on positive and negative emotions. This allowed us to examine whether process and outcome focus have differential emotional consequences for younger and older adults. As a token of our appreciation for their participation in the study, we raffled off 10 gift vouchers for a book or movie tickets (worth approximately \$ 27).

*Sample.* All participants who fell within the pre-defined age groups of young (18 to 23 years) or older adults (> 60 years) were included in the sample. This criterion resulted in 87 participants, with 47 younger adults ( $M = 21.49$ ,  $SD = 1.64$ ; 85 % female, 53.2 % students) and 40 older adults (60-88 years,  $M = 69.58$ ,  $SD = 5.71$ ; 43 % female, 45 % with a college degree, 72.5 % retired).

### *Measures.*

*Preference for process versus outcome focus.* To assess preference for process versus outcome focus, we asked participants to read introductions to two different “thinking exercises”: the introduction to Exercise A centered around ways of pursuing a goal, calling to mind that people pursue goals in different ways (process focus); that to Exercise B centered around the potential benefits of achieving a goal, calling to mind that people pursue goals for specific reasons (outcome focus). After reading the introductions, participants were asked to decide whether they wanted to do “Thinking Exercise A” (“which is about how we do the things we do”) or “Thinking Exercise B” (“which is about why we do the things we do”). The dependent variable was the selection made (Exercise A or B), which indicated the participant’s preference for focusing attention on the goal-pursuit process (A) or the outcome (B).

*Process versus outcome focus exercise.* Participants performed the exercise they had selected. Those who selected the process-focus exercise were to list two successive means by which one could attain the goal of having a good vacation. Those who selected the outcome-focus exercise were to list two successive reasons one could have for having a good vacation. This exercise was modeled after a manipulation used by Freitas, Gollwitzer, and Trope (2004) to induce either an abstract or concrete mindset.

*Positive and negative affect.* As a measure of current affect, the Positive and Negative Affect Schedule (PANAS; Watson, Clark, Tellegen, 1988) was administered. The PANAS consists of 10 positive and 10 negative emotion adjectives. On a scale ranging from 1 (not at all) to 7 (very much), participants indicated how well each of the adjectives described their current feelings. Scores for positive and negative affect were obtained by averaging the respective items. Cronbach’s  $\alpha$  for positive affect was .86 ( $M = 4.54$ ,  $SD = 1.01$ ), for negative affect .81 ( $M = 1.89$ ,  $SD = 0.84$ ). Before the “thinking exercises” were presented, a single item was used to assess life satisfaction as an indicator of general well-being (7-point scale,  $M = 5.37$ ,  $SD = 1.37$ ).

## Results and discussion

*Preference for outcome versus process focus.* Replicating Study 1, a majority of the younger adults (29 of 47, or 61.7 %) selected the outcome-focused “thinking exercise”; this difference was marginally significant ( $\chi^2(1) = 2.47, p = .06$ ). The older adults showed no preference for either type of exercise (50 % selected the outcome-, 50 % the process-focused exercise); this difference was not significant ( $\chi^2(1) = 0.27, p = .19$ ).

*Affective consequences of goal focus.* A 2 (Goal Focus: process vs. outcome focus; between-subjects factor)  $\times$  2 (Age Group: young vs. old; between-subjects factor) ANOVA was conducted with positive and negative affect as dependent variables. In order to control for general well-being, life satisfaction was used as a covariate.

To control for possible gender-related differences, sex was also included as a covariate. As predicted, performing the outcome-focused exercise elicited marginally lower positive affect ( $M = 4.41, SD = 0.96$ ) than performing the process-focused exercise did ( $M = 4.71, SD = 1.07; F(1, 81) = 1.82, p = .09$ , one-tailed). The main effect of goal focus on positive affect was qualified by a significant interaction with age group ( $F(1, 81) = 3.52, p = .03$ , one-tailed). Follow-up analyses showed that, for older adults, the process-focused exercise was followed by significantly higher positive affect ( $M = 5.07, SD = 0.72$ ) than the outcome-focused exercise was ( $M = 4.32, SD = 1.10; F(1, 38) = 6.51, p = .008$ ). For younger adults, there was no such difference ( $F(1, 45) = 0.32, p > .25$ ).

There was no significant main effect of goal focus on negative affect (process focus:  $M = 1.78, SD = 0.80$ ; outcome focus:  $M = 1.96, SD = 0.87; F(1, 81) = 0.59, p > .20$ , one-tailed). There was, however, a marginally significant interaction with age group ( $F(1, 84) = 2.61, p = .06$ ). Follow-up analyses revealed that performing the outcome-focused exercise led to slightly higher negative affect in younger adults ( $M = 2.16, SD = 0.86$ ) than in older adults ( $M = 1.67, SD = 0.81; F(1, 38) = 1.33, p = .13$ ). As for the process-focused exercise, there was no such difference

between younger ( $M = 1.86$ ,  $SD = 0.85$ ) and older adults ( $M = 1.71$ ,  $SD = 0.77$ ;  $F(1, 38) = 0.84$ ,  $p = .43$ ).

Although failing statistical significance, the pattern of frequencies of participants choosing to perform an outcome- over a process-focused exercise were in the same direction as the results of Study 1 regarding a preference for outcome- or process-focused goal descriptions. Younger adults showed a clear preference for outcome focus and selected the process-focused exercise less frequently than older adults did. As this pattern is not statistically significant, however, further studies were needed to determine whether the effect of Study 1 could be replicated with another sample using a different operationalization of goal focus. This was one of the aims of Study 3.

The main goal of Study 2 was to investigate the affective consequences of goal focus. We predicted that process focus would be more likely to be associated with emotional well-being than outcome focus would. Overall, the results confirmed our hypothesis. Focusing on the means of achieving a goal (process-focused “thinking exercise”) was related to higher subsequent positive affect than focusing on the outcomes was.<sup>5</sup> Interestingly, as indicated by an interaction of age and goal focus, this effect held only for older adults, while younger adults showed no such differences. For younger adults, outcome focus – although more preferred – was related to higher subsequent negative affect. It seems, then, that younger adults do not only not profit – but are even harmed – by adopting their preferred outcome focus, while older adults profit by adopting their preferred process focus. One possible interpretation of this pattern is that younger

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<sup>5</sup> Given that the conditions were randomly assigned, pre-existing individual differences in mood should be randomly distributed across the experimental groups and post-manipulation differences can be attributed to goal focus with some confidence. Moreover, controlling for general subjective well-being assessed before the manipulation should add to controlling for preexisting, trait-like individual differences in well-being that are correlated with positive and negative affect (in the case of this study, pre-manipulation well-being was correlated with post-manipulation positive affect ( $r = .27$ ,  $p = .001$ ), and with negative affect ( $r = -.38$ ,  $p < .001$ ).

adults experience a mismatch between their habitual (outcome) focus and the process focus adopted to perform a given exercise; this mismatch might counteract the positive effects of process focus that older adults experience. Younger adults might also more acutely experience the negative effects of outcome focus because their attention is usually constantly focused on the negative discrepancy between actual and goal state, this attention being due to their developmental tasks, which entail achieving certain outcomes (such as getting an educational degree, finding a job, selecting a partner). This interpretation is highly speculative and potential age-related effects on goal focus require further testing. As a further step in this direction, Study 3 included the effects of goal focus on affective well-being and on goal-relevant variables such as perceived distance from the goal.

### **Study 3: Goal focus in the context of a real-life goal**

The main purpose of Study 3 was to replicate and extend the results of the first two studies in the context of a personal goal that younger and older adults pursue in everyday life. As the target goal, we chose starting to exercise regularly because this is a relatively frequent goal of potential relevance for both younger and older adults. Holding goal content constant across age groups makes comparisons of goal *focus* across age groups easier than comparing goals that might differ in many other respects besides goal focus. Another reason for choosing the goal to begin exercising regularly was that outcome and process focus can be operationalized by evaluating the reasons for exercising (e.g., wanting to lose weight or reduce flabbiness as outcomes of exercising vs. enjoying the physical activity or getting together with friends for exercising as process-related aspects of exercising). Study 3 involved two measurement points approximately four months apart. This design allowed us to investigate the effect of goal focus on change in specific goal dimensions. We chose the interval of four months because a substantial number of beginners quit exercising after a few weeks or months (Wagner, 1999). Therefore, the first few months after starting to pursue the goal of exercising regularly should be particularly informative as regards individual differences influencing one's adherence to the pursuit of this goal.



## Method

*Procedure.* The study consisted of two assessment sessions with an average interim of 4.2 months ( $SD = 0.48$ ). At each session, participants completed a set of questionnaires in small groups. At T1, participants were informed about the procedure of the study and signed an informed consent form. They then filled out a short demographic questionnaire and rated the goal of starting to exercise regularly on a number of dimensions. At T2, participants again rated their exercise goals and, in addition, reported how intensively they had exercised since T1 and whether they had given up pursuing the goal. At both assessment sessions, participants were also presented with a number of additional instruments that are not relevant here. At the end of each session, participants were debriefed, thanked, and received reimbursement (approximately \$20).

*Sample.* Participants were from a larger sample recruited from 28 sports facilities in Berlin, namely, from 14 fitness centers, three sports clubs, three university sports programs, and eight other public institutions offering sports classes with trainers (e.g., seniors' centers). The requirements for initial recruitment were that the person: (a) was about to begin or had recently begun a sports activity at one of the above sports facilities; (b) had not regularly engaged in that sports activity for at least nine months; and (c) was either between 19 and 35 years or over 55 years of age. About one third of the initial sample was recruited through posters and brochures distributed in the cooperating sports facilities (with information on the study, participation requirements, and contact persons). The majority of the initial sample was recruited in person at the end of exercise classes and at registration sites of university sport programs. Recruitment took five months, from September 1999 to January 2000. In the analyses reported in this paper, we have included only those participants of the initial sample that were comparable in age to the participants in Studies 1 and 2. Thus, 55 younger (19–25 years,  $M = 22.4$ ,  $SD = 1.5$ ) and 46 older (55–78 years,  $M = 63.8$ ,  $SD = 5.1$ ) adults were included. Of this sample 75% was female. As for highest level of education completed, 10.9% of the participants had graduated from junior high school (8th grade); 22.8% from secondary

school level I (10th grade), and 57.4% from senior high school (12th or 13th grade), and 8.9% of the sample held a university degree.

*Instruments.*

*Personal Goals (T1).* At T1, participants used a 7-point scale to rate their goal of starting to exercise regularly on the following dimensions: (1) perceived distance to goal ( $M = 75.05$ ,  $SD = 1.45$ ); (2) perceived attainability ( $M = 5.64$ ,  $SD = 1.02$ ); (3) goal involvement ( $M = 4.15$ ,  $SD = 0.75$ ); (4) goal importance ( $M = 5.05$ ,  $SD = 1.29$ ); and (5) goal satisfaction ( $M = 5.24$ ,  $SD = 1.27$ ).

*Goal Focus (T1).* Process and outcome goal focus were operationalized using two subscales derived from a scale by Silberstein, Striegel-Moor, Timko, and Rodin (1988) for assessing motives to exercise. Process focus was assessed by three items measuring *enjoyment* using a 5-point response scale (exercising in order to meet new people, to socialize with friends, to have fun; Cronbach's  $\alpha = .68$ ;  $M = 3.48$ ,  $SD = 0.88$ ). Outcome focus was indexed by averaging across seven items assessing *attractiveness*, *tone*, and *weight control* (exercising in order to slim down, lose weight, improve one's appearance, redistribute weight, become more sexually desirable/attractive; Cronbach's  $\alpha = .78$ ;  $M = 2.98$ ,  $SD = 0.92$ ). Process and outcome focus were uncorrelated ( $r = .07$ , ns), indicating that, using this operationalization, process and outcome focus constitute independent constructs rather than opposite poles of a single dimension.

*Goal Pursuit (T2).* At T2, participants again rated their exercise goal on the five dimensions mentioned above: (1) perceived distance to goal ( $M = 75.22$ ,  $SD = 1.5$ ); (2) perceived attainability ( $M = 5.64$ ,  $SD = 1.02$ ); (3) goal involvement ( $M = 4.15$ ,  $SD = 0.75$ ); (4) goal importance ( $M = 5.05$ ,  $SD = 1.29$ ); and (5) goal satisfaction ( $M = 5.24$ ,  $SD = 1.23$ ). In addition, as indicators of goal pursuit, participants rated their exercise adherence using a 6-point scale by estimating (1) how frequently ( $M = 2.75$ ,  $SD = 1.1$ ) and (2) how regularly ( $M = 3.49$ ,  $SD = 1.3$ ) they had exercised since T1.

*Positive and negative affect.* As an indicator of global subjective wellbeing, we used Steyer, et al.'s (1997) multidimensional affect-rating scale. This scale is comprised of a total of 24 adjectives

assessing *positive mood*, *ease*, and *alertness* as dimensions with positive valence, and *negative mood*, *restlessness*, and *fatigue* as dimensions with negative valence, whereby each dimension is indexed by four adjectives. At T2, participants indicated how often they had experienced each emotion during the previous four months – i.e., since T1 – on a 5-point rating scale ranging from 1 (*very seldom*) to 5 (*very often*). Subscale scores were calculated by summing the responses to the items of each of the six subscales. An aggregate score for positive affect was then computed by averaging the scores of the three subscales with positive valence ( $M = 13.8$ ,  $SD = 2.5$ , Cronbach's  $\alpha = .91$ ); an aggregate score for negative affect was computed by averaging the scores of the three subscales with negative valence ( $M = 10.4$ ,  $SD = 2.8$ , Cronbach's  $\alpha = .89$ ).

## Results

In this section, we will first address age-related differences in goal focus and subsequently turn to testing the hypotheses regarding the adaptiveness of goal focus in terms of global subjective well-being and change in perceived goal attainability, distance, importance, involvement, and satisfaction, as well as self-reported goal pursuit (here, exercise adherence).

*Age-related differences in goal focus.* Using a 2 (Goal Focus: process vs. outcome; within-subject factor)  $\times$  2 (Age Group: young vs. old; between-subjects factor) ANOVA revealed the predicted significant interaction of age and goal focus ( $F(1, 97) = 5.74$ ,  $p = .02$ ). As can be seen in Figure 5, younger adults reported higher outcome focus ( $t(99) = 2.84$ ,  $p = .01$ ). However, the two age groups did not differ significantly in process focus ( $t(99) = 70.57$ ,  $p = .57$ ), for the goal to start exercising regularly. Probing further into the within-age-group differences in goal focus, follow-up analyses revealed that, whereas younger adults did not show a significant difference between process and outcome focus ( $t(54) = 1.32$ ,  $p > .19$ ), older adults do report a significantly higher process than outcome focus ( $t(45) = 5.29$ ,  $p < .001$ ).

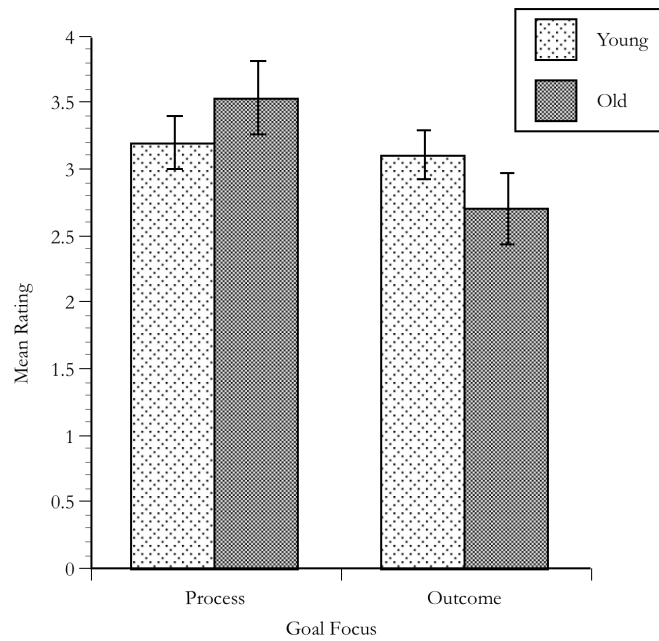


Figure 7: Goal focus as a function of age (means, 95 %-confidence intervals, Study 3)

*Adaptiveness of goal focus.* Before testing the influence of goal focus on the outcome variables included in the present study, we tested for age-related differences. There was a non-significant tendency for older adults to report more positive emotions ( $M_{\text{young}} = 13.5$ ,  $SD = 2.19$ ,  $M_{\text{old}} = 14.1$ ,  $SD = 2.75$ ;  $t(98) = 1.26$ ,  $p = .21$ ), and no age differences in self-reported negative affect ( $M_{\text{young}} = 10.6$ ,  $SD = 2.5$ ;  $M_{\text{old}} = 10.1$ ,  $SD = 3.2$ ;  $t(98) = 0.96$ ,  $p = .34$ ). Younger and older adults differed with respect to goal importance and involvement at T1 (all  $t(99) > 0.61$ ,  $p \leq .001$ ), with older adults showing higher values. There were no age differences regarding distance, attainability, and satisfaction with goal at T1 (all  $t(99) < 0.28$ ,  $p > .34$ ). At T2, however, older adults showed higher scores on all of the goal variables (all  $t(98) > 2.7$ ,  $p \leq .008$ ). Older and younger adults also differed with respect to self-reported frequency and regularity of goal pursuit (here, exercise frequency and regularity). As compared to the younger adults, older adults reported that they exercised somewhat more frequently ( $M_{\text{young}} = 2.56$ ,  $SD = 0.9$ ,  $M_{\text{old}} = 2.98$ ,  $SD = 1.2$ ;  $t(98) = -2.0$ ,  $p < .05$ ), and more regularly ( $M_{\text{young}} = 3.09$ ,  $SD = 1.32$ ,  $M_{\text{old}} = 3.99$ ,  $SD = 1.1$ ),  $t(98) = -3.67$ ,  $p < .001$ ). To take these age-related differences into account, we included age by goal focus

interactions when predicting the adaptiveness of goal focus as indexed by positive and negative affect, goal variables, and subjective exercise frequency and regularity (see below).

Mirroring the results from Study 2, goal focus proved to be related to positive affect at T2 (see Table 7 for a summary of the regression analysis results). As expected, process focus at T1 was associated with positive affect at T2, whereas outcome focus at T1 was not. In Study 3, unlike Study 2, time-lagged predictions also showed that process focus was negatively related to negative affect. Again, outcome focus did not predict negative affect. There was no indication of an interaction of goal focus with age in predicting positive affect ( $F_{\text{change}}(2, 93) = 0.80, p = .45$ ), or negative affect ( $F_{\text{change}}(2, 93) = 1.38, p = .26$ ). These results are consistent with the assumption that process focus contributes to feeling good (and not bad), while outcome focus is not associated with subjective well-being.

*Table 7: Process but not outcome focus as T1 predicts positive and negative affect at T2 (results of regression analyses)*

Criterion T2	Predictors T1	$\beta$	$R^2$ (model)
Positive Affect	Outcome orientation	-.06	.08**
	Process orientation	.29**	
Negative Affect	Outcome orientation	.02	.04*
	Process orientation	-.21	

*Notes:* Regression models were run including sex and education as control variables, neither variable significantly contributed to the prediction of affect. \* $p < .05$ , \*\* $p < .01$ .

In order to take individual differences in the goal variables at T1 into account, we examined how goal focus affects the *change* in the various goal variables. More specifically, to test the hypothesis that outcome focus is negatively related to measures of goal attainability, distance, importance, involvement, and satisfaction, a series of multiple regression analyses were conducted, regressing a goal measure of T2 on the respective goal measure at T1 as a first step, and then entering outcome and process focus as the second step, in order to obtain an estimate of the influence of goal focus on the change of goal measures over a period of four months.

Table 8 presents a summary of the results of the regression analyses. In support of our hypotheses, goal focus was significantly related to all of the goal dimensions; after controlling for goal dimensions at T1 (all  $R^2_{\text{change}} \geq .03$ , all  $F_{\text{change}}(2, 95) \geq 2.17$ , all  $ps \leq .06$ ). As expected, process focus was positively related to change in all of the goal ratings. Specifically, process focus was associated with a decrease in perceived distance to the goal and increases in attainability, involvement, and satisfaction. Only partially confirming our hypotheses, outcome focus was unrelated to change in distance to the goal and attainability. Consistent with expectations, however, outcome focus was related to decreases in goal involvement and satisfaction. The relationship of goal focus was not moderated by age.

There were no significant interactions of age with goal focus (all  $R^2_{\text{change}} \geq .03$ , all  $F_{\text{change}}(2, 91) < 2.23$ , all  $ps > .11$ ). Regression analysis was also used to test whether goal focus at T1 was related to self-rated goal pursuit at T2 (again, controlling for sex and education). Results show, again as expected, that self-reported exercise frequency at T2 was predicted by process focus at T1 ( $\beta = 1.10, p < .01$ ), but not by outcome focus at T1 ( $\beta = -0.40, p = .27$ ). There was a significant interaction of age and process focus ( $\beta = -0.73, p < .01$ ), but not for age and outcome focus ( $\beta = 0.34, p = .14$ ). For the last step of entering the interaction terms,  $F_{\text{change}}$  was significant ( $F_{\text{change}}(2, 93) = 5.88, p = .01$ ). Self-reported regularity at T2 was also predicted by process focus at T1 ( $\beta = 0.97, p = .05$ ), but not by outcome focus at T1 ( $\beta = -0.66, p = .15$ ). There was a tendency for an interaction of age with process focus ( $\beta = -0.52, p = .08$ ), but not for outcome focus ( $\beta = 0.46, p = .12$ ). For the last step of entering the interaction terms,  $F_{\text{change}}$  was only marginally significant ( $F_{\text{change}}(2, 93) = 2.75, p = .07$ ).

The beneficial effects of process focus on measures of goal pursuit, then, are to some degree dependent on age. Follow-up regression analyses conducted separately for younger and older adults showed that, contrary to our hypotheses, process focus was only beneficial for younger adults regarding exercise frequency, again controlling for education and sex ( $\beta = 0.39, p < .01, F_{\text{change}}(2, 52) = 4.95, p = .01$ ), but did not significantly predict exercise frequency in older

adults after controlling for sex and education ( $F_{\text{change}}(2, 41) = 2.18, p = .13$ ). The same pattern emerged for self-reported exercise regularity. Younger adults reported exercising more regularly when adopting a process focus, after controlling for education and sex ( $\beta = 0.28, p < .05, F_{\text{change}}(2, 52) = 3.3, p < .05$ ), whereas process focus failed to significantly predict how regularly older adults exercise ( $F_{\text{change}}(2, 42) = 1.27, p = .29$ ).

*Table 8:* Longitudinal predictions of positive goal dimensions at T2 (controlling for T1) by process and outcome goal focus (T1): Results of regression analyses

Criterion T2	Predictors T1	$\beta$	$R^2$ (model)
Distance to goal	Distance to goal T1	-.15	.15**
	Outcome orientation	-.06	
	Process orientation	-.31**	
Attainability	Attainability T1	.51**	.35**
	Outcome orientation	-.05	
	Process orientation	.18*	
Satisfaction	Satisfaction T1	.28**	.21**
	Outcome orientation	-.22*	
	Process orientation	.21*	
Involvement	Involvement T1	.40**	.23**
	Outcome orientation	-.18*	
	Process orientation	.19*	
Importance	Importance T1	.46**	.28**
	Outcome orientation	-.06	
	Process orientation	.18*	

*Note:* \* $p < .05$ ; \*\* $p < .01$ .

Taken together, the results of this study show the expected age-related differences in goal focus: While older adults were more likely to be process focused in pursuing their exercise-related goal, younger adults focused more on the outcome. Regardless of age, process focus contributed longitudinally to positive goal evaluations such as goal satisfaction or subjective distance to the goal. Fitting into this pattern of results, process focus was associated with higher positive and lower negative emotions for both age groups. However, a look at outcomes more closely related

to actual goal performance revealed that it was particularly the younger age group that profited from a process focus on their exercise-related goal. Younger but not older adults reported higher exercise frequency and regularity when adopting a process focus.

### **General Discussion**

The present paper presents, for the first time, converging evidence of age-related differences in process and outcome goal focus from three studies using different operationalizations of goal focus. Study 1 investigated preference for goal focus in the description of goals either in terms of their means (process focus) or their consequences (outcome focus). Study 2 assessed goal focus as the selection of one of two exercises (“thinking exercises”) that focus attention on either the means involved (process) or the related higher-order goals (outcomes). Finally, Study 3 used personal reasons for exercising to operationalize process and outcome focus. Across these different types of operationalizations, the pattern of results – although not statistically significant in Study 2 – suggests that younger adults show a preference for outcome over process goal focus and a lower process focus than older adults. For instance, in Study 3 younger adults reported a stronger focus on the outcome of their exercise goal (e.g., increased attractiveness) than older adults. Moreover, older adults reported a stronger focus on the process of goal pursuit (e.g., enjoying exercising) than on the outcome. This finding speaks against the hypothesis that older adults prefer to focus on tangible outcomes rather than on the continuous process of pursuing a goal. Note, that in the present study, the goal – starting to exercise regularly – was the same for younger and older adults. It is a goal that both age groups can achieve. Therefore, the age differences in goal focus found in the Study 3 cannot be attributed to differences in goals.

Studies 2 and 3 addressed the question of whether outcome and process focus are differentially associated with goal-relevant outcomes. Both studies required online participation. Online studies are convenient for participants as they do not need to leave their home and come to the laboratory in the university to participate. For older adults, this might mean that even



people who are somewhat limited in their mobility due to health-related reasons or feel nervous about coming to a university, can easily participate in a study. These factors might increase the heterogeneity of the sample compared to a traditional study taking place in a laboratory. At the same time, however, one could argue that using the Internet is not as common among older adults leading to increased sample selectivity. In fact, when investigating the age-distribution of samples of online studies, older adults are clearly underrepresented (Reips, 2001). Regarding other characteristics such as IQ distribution, however, online samples seem to be highly representative (Reips, 2001). It seems, then, that advantages and disadvantages of online versus laboratory testing might cancel each other out. As is typical for laboratory studies too, the online studies reported here used convenience samples and generalizability is based on replications and the use of different methodology rather than representative samples.

Study 2 provided initial evidence that process focus is related to positive affect, a finding that was replicated in Study 3. Contrary to Study 3, which did not reveal age-differential effects of goal focus on affect, Study 2 suggests that older adults might profit more from a process focus while younger adults might even be harmed when adopting an outcome focus. The two studies differ with respect to the relevance of the goal (not personally important in Study 2 vs. high personal importance in Study 3) as well as the time frame of these goals (minutes in Study 2, months in Study 3). Therefore, differences between these two studies might indicate the role of the kind of goal being pursued with a specific goal focus.

Going beyond affective consequences of goal focus, Study 3 showed that, regardless of age, process focus was associated with a decrease in the distance to the goal over time, increased attainability, importance, and satisfaction as well as higher goal involvement over a period of four months. Process focus was also positively related to measures of goal pursuit (self-reported exercise frequency and regularity). In contrast, outcome focus was not or even negatively related to measures of positive evaluation of the goal and goal pursuit. This pattern of results suggests that, at least in the context of the goal to start exercising regularly, process focus is more adaptive

for various measures of subjective goal satisfaction and for goal pursuit. Interestingly, the positive effect of goal focus was not affected by age regarding subjective evaluations. Younger as well as older adults rated their goal to exercise regularly more favourably when adopting a process focus. Contrary to our hypotheses, however, younger adults profited more than older adults from a process focus with respect to measures of actual goal pursuit. Interestingly, then, in the context of exercise, younger adults are less likely to focus on the process although they profit particularly from such a focus for increasing goal-relevant behavior (*viz.*, exercising frequently and regularly). It might be the case that stepping outside the box of their more typical way of pursuing goals, namely by focusing on the outcome, motivates younger adults more strongly to actually do something for their goals than it does older adults, who are more likely to go about their goals by focusing on the process. This is merely speculative at this point and warrants further testing.

There are basically two complementary explanations for the age-related differences in goal focus. First, older adults may have learned through repeated experience that reaching goals, though important, leads to a hedonic treadmill that can only be counteracted by focusing on the process of goal pursuit instead of the consequences related to reaching one's goal. Second, having reached or surpassed one's personal asymptotic level in functioning, reaching new outcomes might become more and more difficult with increasing age. Focusing on the process instead of the outcome of a goal might help buffer against disappointment when not reaching the goal. In fact, attractiveness might be just one of these domains. Age differences might be less pronounced or even absent when considering a domain where younger and older adults do not differ regarding having reached the asymptote (see Ebner et al., 2006, for a similar approach for gain versus maintenance/loss orientation in goals). Further studies are needed to identify which of the factors associated with age-related differences contribute to an age-differential goal focus. Given that older adults are more likely to adopt a process than an outcome focus, this might contribute to continued positive involvement with goals and general well-being. Future studies need to address the question of generalizability of goal pursuit to other life domains.

One of the shortcomings of Study 3 is the indirect operationalization of goal focus via motives to exercise. One might argue that the specific motives we used for operationalizing process and outcome focus are themselves age-related. Wanting to work on losing or distributing weight might be a “young” motive for exercising, wanting to enjoy the work-out or doing something with friends could be seen as an “old” goal. We believe, however, that there is nothing inherently young in wanting to lose weight and nothing per se old in wanting to enjoy what one is doing. If these motives seem “young” or “old” to us, this might be the case because there is some socially shared expectation that younger adults are more outcome-focused in their goal pursuit than older adults, whom we might expect to be more process-oriented. To the best of our knowledge, there is currently no data available addressing the question of age-related expectations about goal focus. Moreover, the pattern of results regarding the preference for goal focus and the affective consequences converges with the results of Studies 1 and 2 using very different operationalizations of goal focus.

In fact, one of the strengths of the present studies is that they involve different measures of goal focus, attesting to the robustness of findings across different modes of assessment and samples. While Studies 1 and 2 did not concern the participants’ personal goals, Study 3 involved a mini-longitudinal design in a real-life setting that was freely chosen by both age groups.

To our knowledge, the present studies are the first to demonstrate age-related differences in process and outcome focus. As focusing on the process of goal pursuit seems to be more beneficial motivationally and emotionally, the stronger process focus in old age may be among the processes contributing to successful aging.

**PART V: STAYING ON AND GETTING BACK ON THE WAGON: AGE-RELATED  
IMPROVEMENT IN SELF-REGULATION DURING A LOW-CALORIE DIET**

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### Abstract

The present study investigated whether self-regulation improves across adulthood, especially regarding the mastery of setbacks and failure in an important health-related behavior, namely, staying on a low-calorie diet when overweight.  $N = 126$  overweight women (19-77 years,  $M = 47.2$ ) filled out weekly questionnaires on the outcomes of behavioral, emotional, and cognitive self-regulation during a dieting program; outcomes included deviations from the diet, weight loss, affect, and rumination. Confirming hypotheses, multilevel analyses revealed that - even after controlling for prior dieting attempts - age was associated with better self-reported self-regulation (i.e., fewer deviations from the diet, lower disinhibition and rumination after failure, higher affective well-being), but not with more weight loss. Results suggest that self-regulation improves with age and shows positive effects on subjective indicators of successfully coping with setbacks, but does not directly influence the target-outcome weight loss.

*Keywords:* Self-regulation, dieting, failure, rumination, health behavior

## **Introduction**

The successful pursuit of personal goals poses a multitude of challenges to self-regulation (Baumeister & Heatherton, 1996). Consider, for example, a woman who needs to lose weight and therefore goes on a low-calorie diet. She has to inhibit her eating habits and withstand the temptations of the immediate reward of eating fatty and sweet foods. Even if she is successful in doing so, her progress towards her desired weight may be slow, especially if she is following recommendations for healthy and steady weight loss (National Institutes of Health, 2003). The slow rate of progress towards her goal (Carver & Scheier, 1990) and the continuous behavioral inhibition (Herman & Polivy, 2004) might result in negative affect, which has to be regulated. Moreover, it is highly likely that, from time to time, she will fail to resist the temptation to eat food that is not on the diet plan. In turn, these failures might have a negative impact on her affective well-being because they threaten the goal of losing weight (Pomerantz et al., 2000). She also might feel that it reflects badly on her self-regulation skills, which might lead to rumination about dieting (Hart & Chiovari, 1998). Moreover, to recover from the lapse and proceed with the diet, she might feel the urge to compensate for the transgression and to stop ruminating, which requires additional self-regulation. How do people master the self-regulatory demands posed by complex health-related behaviors such as dieting? Do people learn self-regulation skills over time so that they get better as they age?

### **Self-regulation and aging**

Controlling thoughts, managing emotions, and overcoming unwanted behavioral impulses (such as eating tasty high-calorie food) all require self-regulation, that is, the capacity to alter one's cognitive, emotional, or behavioral responses in the service of long-term goals (e.g., losing weight; Baumeister et al., 2007). As people pursue long-term goals that require self-regulation during adolescence and adulthood, they should acquire knowledge about and practice in self-regulation, that is, in staying on track when effort and persistence are required to pursue a difficult goal and overcome setbacks and obstacles on the way (Freund, Nikitin, & Ritter, 2009;

Wrosch & Freund, 2001). A second factor that might contribute to an improvement in self-regulation across adulthood is the increase in the motivational orientation towards counteracting losses in the service of maintaining functioning across adulthood (Freund & Ebner, 2005). In a series of experiments, Freund (2006b) showed that, compared to younger adults, older adults are behaviorally more persistent when pursuing the goal to get back to a prior level of performance after encountering a loss. Similarly, Ebner et al. (2006) found that older adults report a higher level of orientation towards the maintenance of functioning and the prevention of losses than younger adults do, and that this goal orientation is related to higher affective well-being. Therefore, in the pursuit of goals, older adults might be more used to and practiced in dealing with setbacks and losses and thus not get as upset by them. As Freund's (2006) results suggest, older adults seem to be more persistent in dealing with losses than younger adults. This might help them to maintain or restart health-related behaviors such as dieting even when weight loss stagnates or after having failed to adhere to the diet.

Prior research is consistent with the assumption that self-regulation improves through practice. In a study by Muraven, Baumeister, and Tice (1999), college students exercised self-regulation in one of three different domains. Over the course of two weeks, they either had to (1) monitor and improve their posture, (2) regulate their mood, or (3) monitor and record what they ate. As an independent measure of self-regulation, the authors tested hand-grip strength. In line with the hypothesized training of general-purpose self-regulatory skills through practice, participants' hand-grip strength improved regardless of the specific training. Specifically, after depleting self-regulation through a thought-suppression exercise, people who had participated in any of the three training groups improved their subsequent hand-grip performance. Thus, prior exercise of self-regulation might have diminished the fatiguing of self-regulation, as expressed in the grip exercise.

To our knowledge, there is no research on practice effects or age-related differences in the inhibition of unwanted impulses in the long-term pursuit of personal goals such as dieting.

Baumeister and Heatherton (1996), however, propose that a practice effect might explain that most people who try to give up smoking, reduce their caloric intake, or refrain from drugs, are successful in the long run (Schachter, 1982). Although this interpretation is plausible, the results could also simply reflect a purely stochastic effect, namely, that the overall probability of being successful necessarily increases with the number of attempts. In other words, there is a higher a priori chance of succeeding after multiple attempts (Schachter, 1982). Therefore, as a more stringent test of the practice effect, in the present research, we control for the number of prior dieting attempts when testing age-related effects on self-regulation in dieting.

In contrast to the lack of research on changes in behavioral self-regulation in the context of goal pursuit, a vast amount of research on executive functioning suggests that older adults show restrictions in their ability to inhibit dominant but unwanted responses, such as reading a color-word instead of naming its color in a Stroop task (e.g., Hasher, Zacks, & May, 1999; for a review, see Verhaeghen & Cerella, 2002) and task-set switching (e.g., Kray & Lindenberger, 2000). Results like these are often explained by the “frontal aging hypothesis” which suggests that those cognitive functions that are primarily localized in the prefrontal cortex are particularly affected by normal aging (e.g., Tisserand & Jolles, 2003; Treitz, Heyder, & Daum, 2007). Hofmann et al. (2009) have shown that it is exactly these kinds of cognitive functions (attention, inhibition) that contribute significantly to the impulse control of eating behavior. Accordingly, one might expect an age-related decline in the control of eating impulses. Note, however, that results on age-related changes in executive control usually stem from laboratory studies and investigate very basic behaviors that can easily be assessed using reaction time paradigms. Tasks typically used in the laboratory are mostly chosen for indexing inhibition in the clearest possible way rather than capturing the complexity of motivated behavior in the context of long-term goal pursuit. Attesting to the importance of motivational factors, studies show that performance differences between young and older adults decline when tasks are meaningful to older adults (e.g., Germain & Hess, 2007; Hess, Rosenberg, & Waters, 2000). Thus, the pursuit of highly



important goals might not be severely affected by age-related cognitive decline. In fact, there is some research showing that older adults' increased competence in setting and pursuing personal goals might counteract the described resource losses (e.g., Bauer & McAdams, 2004; Freund et al., 2009; Riediger & Freund, 2006, 2008; Sheldon & Kasser, 2001).

In a similar vein, there is a substantial number of studies providing evidence for age-related improvements in emotion regulation. Older adults report more self-control over their emotions (Gross, Carstensen, Tsai, Götestam Skorpen, & Hsu, 1997; Lawton, Klebvan, Rajagopal, & Dean, 1992; Phillips, Henry, Hosie, & Milne, 2006). When negative affect is experimentally induced and adults are instructed to regulate their emotional experience or expression, they seem to outperform younger adults (Phillips, Henry, Hosie, & Milne, 2008; but see Kunzmann, Kupperbusch, & Levenson, 2005; Magai, Consedine, Krivoshekova, Kudadjie-Gyamfi, & McPherson, 2006). Older adults also appear to experience negative emotions less frequently than but positive emotions just as often as younger adults, leading to an overall positive emotional balance (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Charles, Reynolds, & Gatz, 2001; Kunzmann, 2008). There is also some evidence that a high level of arousal might be experienced negatively in older adults (Grühn & Scheibe, 2008; Keil & Freund, 2009), which might motivate older adults to seek out less arousing positive emotions (Labouvie-Vief & Marquez, 2004). Some researchers have proposed that positive changes in emotion regulation might reflect an increased psychological maturity in coping with stressful events (e.g., Folkman, Lazarus, Pimley, & Novacek, 1987; Sheldon & Kasser, 2001; Vaillant, 1977). In line with this assumption, Scheibe and Blanchard-Fields (2009) showed that regulating negative affect has lower costs for older than for younger adults as it impairs their performance in a working memory task less. Both maturity and an increased effectiveness in emotion regulation might reflect practice effects as older adults have typically encountered frequent occasions to exercise the management of negative emotional states over the lifespan.

Regarding age-related changes in cognitive self-regulation, namely the regulation of thought, there are currently two opposing perspectives: Some researchers suggest that there is age-related decline in the suppression of task-irrelevant thoughts (e.g., Arbuckle & Pushkar Gold, 1993), while others propose that older adults experience fewer task-unrelated thought intrusions (Giambra, 1989) and report less ruminative thought than younger adults (Erskine, Kvavilashvili, Conway, & Myers, 2007). To our knowledge, there is no research investigating age-related differences in thought suppression in the context of pursuing long-term goals in everyday life. Assuming that people practice the monitoring of thoughts – including the suppression of unwanted, negative thoughts related to the pursuit of their goals – throughout adulthood, this aspect of self-regulation might also improve with age. Across adulthood, people might learn that getting upset about not achieving a goal as quickly as desired or that ruminating about setbacks is inefficient or even counterproductive and might have acquired strategies for focusing their attention on other aspects of the task that are more helpful for the maintenance of goal-relevant behavior and emotion regulation.

In sum, then, four lines of research suggest that self-regulation might increase across adulthood, namely: (1) research on the practice effects of self-regulation, (2) research on increased motivation to counteract losses with age, (3) research on age-related increases in emotion regulation, and (4) research on accumulated experiences with the pursuit of long-term goals across adulthood. Therefore, our central hypothesis states that older adults exhibit better self-regulation skills than younger adults. These differences of self-regulation between younger and older adults should be evident in the self-regulation of behavior, emotion, and thought. Applying this hypothesis to a health-related behavior that requires high levels of self-regulation for extended periods of time as well as good skills in managing failure, namely dieting when overweight, we expect that older adults report fewer deviations from the diet and more compensation after lapses during dieting (instead of disinhibited eating in the sense of a “what

the hell” effect; Cochran & Tesser, 1996; Polivy & Herman, 1985). Consequently, during the diet, older adults should lose more weight than younger adults. When it comes to the regulation of emotions, older adults should report higher positive and less negative affect than younger adults during the course of dieting and especially less intense negative affective consequences after failure to adhere to the dietary requirements. Finally, older adults should report less rumination after lapses. If people are able to practice general self-regulation skills and apply them to different functional or life domains, positive age effects should be maintained even after controlling for prior dieting attempts.

### **Method**

Dieting lends itself particularly well to the investigation of age-related differences in self-regulation: First, there are adults of all ages who pursue the goal of losing weight. Although the specific motives for weight loss might differ between younger and older adults (O’Brien et al., 2007), the strength of the motivation should be equal. Furthermore, reducing one’s weight seems to be a very difficult goal challenging different components of self-regulation over a long time. As its pursuit is often hampered by setbacks (Mann et al., 2007), dieting offers a way of investigating aspects of self-regulation pertaining to the mastery of difficulties and failure experiences during goal pursuit. Moreover, by measuring participants’ weight prior to and after the diet, it is possible to objectify the success of self-regulation. Finally, as the World Health Organization (2000) has declared that overweight and obesity have reached epidemic proportions globally and as overweight and obesity are followed by severe social, psychological, and health consequences (for a review, see Stroebe, 2008), we consider fostering and understanding self-regulation during the pursuit of a weight-loss goal to be a valuable field of application for our research.

### **Participants**

Overweight and obese women were invited to participate in a study on weight loss via advertisements in local newspapers. 126 women with a Body Mass Index (BMI;  $\text{kg}/\text{m}^2$ ; weight

and height self-reported) of 25 or over, the criterion for overweight as defined by the World Health Organization (2000), participated in the study. They were between 19 and 77 years ( $M = 47.2$ ,  $SD = 15.9$ ), had an initial weight of 57 to 129 kg ( $M = 84.9$ ,  $SD = 13.8$ ), a BMI of 25 to 46 kg/m<sup>2</sup> ( $M = 31.6$ ,  $SD = 5.0$ ), reported having been overweight for 1 to 43 years ( $M = 13.8$ ,  $SD = 9.3$ ), and intended to lose at least 2 kg. Forty-nine (39%) of them had completed the highest school track in Switzerland (Gymnasium).

### **Procedure**

Before starting the diet, participants came to a group meeting for an instruction session. These sessions took place in groups of 2 to 25 women. In the beginning, participants' weight and height were measured. Afterwards, they received a book that explained the "Brigitte" diet in detail (Gerlach et al., 2007)<sup>1</sup>. This particular diet was chosen because an independent German consumer organization ("Stiftung Warentest," 2005) recommended it as a healthy, balanced diet with a high probability of successful weight loss and subsequent stabilization. Participants were instructed to start dieting on the first Monday after the instruction sessions, which took place on Fridays and Saturdays. They agreed to adhere to the diet for six weeks. During the six weeks, every Saturday participants were to fill out a questionnaire, administered via Internet ([www.limesurvey.org](http://www.limesurvey.org)), about the preceding week. As a reminder, participants received e-mails with a link to the questionnaire every Saturday. To obtain an objective measure of weight loss, one week after the official end of the diet (i.e., about 7.5 weeks after the instruction session), participants were weighed. Finally, they received 70 Swiss francs (about \$60) and the diet book for participating in the study.

### **Measures**

The following predictors of self-regulatory outcomes were assessed once.

*Age.* Chronological age was assessed with other sociodemographic variables in the first instruction session.

*Prior dieting attempts.* To assess this control variable, a single item asked participants to indicate how many dieting attempts they had made during the last two years. We restricted the time frame to the last two years as we did not expect participants with long histories of overweight to be able to make realistic estimates. Furthermore, we did not want this predictor to be highly correlated with chronological age while still reflecting a base rate indicating the probability of being successful in the long run. After the exclusion of an outlier who indicated 100 attempts, the range of reported previous attempts was 0-20 ( $M = 2.3$ ,  $SD = 3.1$ ).

The weekly web-based questionnaire measured the following outcomes of behavioral, emotional, and cognitive self-regulation. If not noted otherwise, rating scales ranged from 0 = *not at all* to 6 = *very much*. Descriptive statistics for all dependent variable measures as well as Cronbach's alphas are displayed in Table 9.

*Deviations from diet.* We assessed deviations from the diet with the single item "*How much did you deviate from the dietary requirements during the last week?*"

*Disinhibition after failure.* We assessed disinhibition versus compensation after failure on a bipolar scale with six self-developed items (see Appendix B). As a dependent measure we calculated the average score for disinhibition over the six items. Higher scores on the scale indicate a tendency to show disinhibited eating after dieting lapses, whereas lower scores indicate compensation.

*Weight loss.* Weight was measured objectively before and after the diet. Participants also indicated their current weight in the weekly questionnaires, so we were able to compute the difference between the previous week's and the current weight as an indicator of weekly weight loss (in kg).

The outcomes of emotion regulation were measured as follows.

*Positive and negative affect.* Affective well-being was measured with a 12-item short version of the Multidimensional Mood Questionnaire (Steyer et al., 1997). It measures affective states on the dimensions mood, arousal, and vigilance, with four adjectives each. Participants indicated

how much they had felt these affects during the previous week (e.g., “*content*,” “*rested*,” “*composed*”). We computed two separate mean scores indicating the previous week’s average positive and negative affect for each measurement occasion encompassing only the positive or the negative items, respectively.

*Rumination after failure.* Rumination after failure was measured with a 6-item questionnaire that was self-developed in accordance with Kuhl (1990). We calculated the average score for rumination over the six items. Higher scores on this dependent variable indicate a stronger tendency to ruminate about deviations from the dietary requirements (see Appendix A).

### **Statistical analyses**

Due to the nested structure of the data (i.e., six measurement points at level 1 nested within  $N = 126$  persons at level 2), multilevel regression was used for analyzing the data (linear mixed model procedure with SPSS 16). Restricted maximum likelihood parameter estimates (fixed intercept and slopes) were obtained by fitting multilevel regression models with first-order autoregressive residual covariance structures. This procedure seemed appropriate as residual variances were significantly correlated in all multilevel analyses (all  $ps \leq .005$ ). These correlations decreased the more temporally distant the assessed variables were from each other.

The interpretation of the multilevel fixed effects shown is equivalent to that of parameter estimates in ordinary least squares regression. Due to the nature of our hypotheses, multilevel models included only fixed effects on the prediction of participants’ weekly reports of deviations from the diet, disinhibition, positive and negative affect, rumination after failure, and weight loss (level 1) by age and number of prior dieting attempts (level 2). We did not expect changes in self-regulation over the short dieting period of six weeks. Therefore, we did not estimate the effect of time on outcomes of self-regulation. To avoid multicollinearity, predictors that were also included in interaction terms (age, deviations from diet, disinhibition) were grand-mean centered prior to analyses (Aiken & West, 1991). Presented degrees of freedom are Satterthwaite-approximated and rounded (SPSS, 2005).

## Results

### Self-regulation of behavior

As expected, age was negatively associated with deviations from the diet and disinhibition after failure as were number of previous dieting attempts (see Table 10). Contrary to expectation,

*Table 9:* Descriptive statistics for dependent variable measures (aggregated over  $N = 126$  participants and a maximum of six measurement occasions)

	<i>Min – Max</i>	<i>M</i>	<i>SD</i>	Cronbach's alpha
Deviations from diet	0.00 – 6.00	2.28	1.73	-
Disinhibition	0.00 – 6.00	2.66	1.29	> .64
Weekly weight loss in kg <sup>a</sup>	-10.00 – 9.80	0.64	1.20	-
Positive affect	0.67 – 6.00	4.22	1.17	> .74
Negative affect	0.00 – 5.67	1.41	1.28	> .86
Rumination	0.00 – 5.33	2.58	1.26	> .68

*Note:* <sup>a</sup>Negative values indicate weight gain.

however, neither age nor number of previous dieting attempts had an effect on actual weight loss. This pattern of results was unexpected and somewhat paradoxical: Although, and as predicted, older adults show fewer deviations from the diet, they do not lose more weight. To follow up this finding by exploring age-related differences in the effects of reported deviations from the diet and actual weight, an additional multilevel analysis was conducted. It revealed a marginally significant interaction effect of Age  $\times$  Deviations from the diet on weekly weight loss ( $Estimate = .003$ ,  $SE = .00$ ,  $p = .06$ ; the model also included fixed effects of intercept, age, deviations, and number of previous dieting attempts on weekly weight loss). To compare the relation between deviations from the diet and actual weight loss in younger and older adults, we built two age groups through median split ( $n = 64$  younger adults: 19-45 years,  $M = 33.6$ ,  $SD = 7.5$ ;  $n = 62$  older adults: 47-77 years,  $M = 61.3$ ,  $SD = 7.6$ ). Follow-up regression analyses revealed that, in younger adults, deviations from the diet accounted for 9% of the variance in actual weekly weight loss ( $p < .001$ ), but only for 3% in older adults ( $p < .01$ ). As these results indicate,

reported deviations were more closely related to actual weight loss in younger than in older adults.

*Table 10:* Selected results from multilevel regression models: Estimates of fixed effects predicting deviations from diet, disinhibition, and weekly weight loss ( $N = 126$ , max. six assessments)

Parameter	Deviations			Disinhibition			Weight loss		
	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>
Intercept	3.46 (.25)	10.76 (158)	.000	3.55 (.25)	14.39 (154)	.000	.51 (.15)	3.35 (210)	.001
Number of previous dieting attempts (2 yrs)	.02 (.01)	1.65 (143)	.101	-.02 (.01)	-2.66 (140)	.009	.00 (.01)	.22 (291)	.830
Age	<b>-.03</b> (.01)	<b>-3.98</b> (157)	<b>.000</b>	<b>-.02</b> (.01)	<b>-3.98</b> (157)	<b>.001</b>	.00 (.00)	.80 (207)	.424

*Note.* Bold values represent significant parameter estimates that are in line with the hypotheses. The predictor “age” was grand-mean centered before the analysis. The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Number of previous dieting attempts}_{ij} + \gamma_{02}\text{Age}_{ij} + u_{0j}$ .

Repeating the same analysis with disinhibition as a possible moderator did not reveal an interaction effect for Age  $\times$  Disinhibition ( $\text{Estimate} = .00$ ,  $SE = .00$ ,  $p = .69$ ; the model also included fixed effects of intercept, age, disinhibition, and number of previous dieting attempts on weekly weight loss as well as random effects for the intercept and residual). This indicates that, although deviations and disinhibition were correlated ( $r = .38$ ,  $p < .001$ ), they might have different functions for weight loss. This will be addressed in more detail in the discussion section.

### Self-regulation of affect

As shown in Tables 11 and 12, deviations from the diet affected both positive and negative affect in the expected directions. When controlling for the impact of number of previous dieting attempts, age was positively related to positive affect and negatively related to negative affect during the diet. There were no significant interaction effects of Age  $\times$  Deviations



from diet on affect. Older and younger adults, then, did not differ in their affective reactions to deviations.

*Table 11:* Selected results from multilevel regression models: Estimates of fixed effects predicting weekly positive affect, negative affect, and rumination ( $N = 126$ , max. six assessments)

Parameter	Positive affect			Negative affect			Rumination		
	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>
Intercept	4.14 (.07)	60.52 (160)	.000	1.47 (.07)	19.86 (160)	.000	2.70 (.09)	30.63 (130)	.000
Number of previous dieting attempts (2 yrs)	.02 (.02)	2.38 (144)	.019	-.01 (.01)	-1.57 (145)	.119	-.02 (.01)	-2.23 (119)	.028
Age	<b>.02</b> (.00)	<b>3.87</b> (163)	<b>.000</b>	<b>-.02</b> (.00)	<b>-3.91</b> (163)	<b>.000</b>	<b>-.02</b> (.01)	<b>-3.79</b> (133)	<b>.000</b>
Deviations from diet	-.07 (.03)	-2.29 (558)	.022	.07 (.03)	2.02 (555)	.044	.04 (.02)	1.70 (520)	.097
Age×Deviations from diet	.00 (.00)	-.79 (543)	.433	.00 (.00)	.14 (537)	.092	.00 (.00)	1.96 (536)	.051

*Note.* Bold values represent significant parameter estimates that are in line with the hypotheses. The predictors “age” and “deviations from diet” were grand-mean centered before the analyses. The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments:  $\text{Dependent Variable} = \beta_{0j} + \beta_{1j}\text{Deviations from diet} + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Age}_j + \gamma_{02}\text{Number of previous dieting attempts}_{ij} + u_{0j}$  and  $\beta_{1j} = \gamma_{10} + \gamma_{11}\text{Age}_j + u_{1j}$ .

When repeating the analyses with disinhibition instead of deviations from the diet as a predictor, the pattern of results remained largely the same. Again, age was significantly positively associated with affective well-being, while the amount of disinhibition negatively affected affective well-being during the diet. Older and younger adults did not differ in their affective reactions to disinhibition.

### Self-regulation of thought

After controlling for the impact of number of previous dieting attempts, age was significantly negatively related to rumination after failure in both multilevel models including either deviations from the diet or disinhibition after failure as predictors. There was neither an

Table 12: Selected results from multilevel regression models: Estimates of fixed effects predicting weekly positive affect, negative affect, and rumination ( $N = 126$ , max. six assessments)

Parameter	Positive affect			Negative affect			Rumination		
	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>	<i>Estimate</i> ( <i>SE</i> )	<i>t</i> ( <i>approx df</i> )	<i>p</i>
Intercept	4.16 (.07)	63.26 (157)	.000	1.46 (.07)	20.29 (158)	.000	2.66 (.08)	32.93 (127)	.000
Number of previous dieting attempts (2 yrs)	.01 (.01)	1.55 (149)	.122	-.01 (.01)	-.98 (150)	.328	.00 (.01)	-1.68 (121)	.097
Age	<b>.02</b> (.00)	<b>3.89</b> (161)	<b>.000</b>	<b>-.02</b> (.00)	<b>-3.90</b> (162)	<b>.000</b>	<b>-.02</b> (.00)	<b>-3.49</b> (130)	<b>.001</b>
Disinhibition	-.14 (.04)	-3.50 (547)	.000	.13 (.04)	2.98 (544)	.003	.22 (.03)	6.61 (533)	.000
Age×Disin- hibition	.00 (.00)	-1.37 (556)	.173	.00 (.00)	.30 (553)	.762	.00 (.00)	.80 (525)	.423

*Note.* Bold values represent significant parameter estimates that are in line with the hypotheses. The predictors “age” and “disinhibition” were grand-mean centered before the analyses. The full models included two levels, namely, assessments nested within persons. Level 1 comprised assessments: Dependent Variable =  $\beta_{0j} + \beta_{1j}\text{Disinhibition}_i + r_{ij}$ . Level 2 comprised persons:  $\beta_{0j} = \gamma_{00} + \gamma_{01}\text{Age}_j + \gamma_{02}\text{Number of previous dieting attempts}_j + \mu_{0j}$  and  $\beta_{1j} = \gamma_{10} + \gamma_{11}\text{Age}_j + \mu_{1j}$ .

interaction effect of Age  $\times$  Deviations nor of Age  $\times$  Disinhibition on how much rumination was reported (see Tables 11 and 12). Thus, there were no age differences in the self-regulation of thought after deviations from the diet or behavioral disinhibition.

## Discussion

The present study supports the central hypothesis of this study: Older adults reported less deviations from the diet, less disinhibited eating after lapses, more positive affect, less negative affect, and less rumination after failure to adhere to the dietary requirements. We interpret this pattern of findings as an age-related increase in self-regulation regarding their eating behavior, affect, and thought during a low-calorie diet. The age-related difference in self-regulation capacity could be due to accumulated experiences with a multitude of situations that challenge an individual’s self-regulation. As a consequence, practice effects might occur

(Baumeister & Heatherton, 1996) that could accumulate over the lifespan (Freund et al., 2009; Wrosch & Freund, 2001). Older adults may have learned strategies that help them to master difficult situations during goal pursuit. They may have learned to not attend to stimuli that impede the pursuit of their goals, for example, tasty food that does not meet the dietary demands (Hofmann et al., 2009; Peake, Hebl, & Mischel, 2002; Rodriguez, Mischel, & Shoda, 1989). Even if attentional control is likely to decline with age, older adults might be able to down-regulate their immediate affective reaction to stimuli like tempting food and inhibit unwanted responses such as eating fattening foods (Hofmann et al., 2009; Logan, 1997; Metcalfe & Mischel, 1999). Accordingly, they might experience themselves as successful during goal pursuit and report higher affective well-being. Older adults also reported less disinhibited eating after lapses and suffered less from rumination about their failure to adhere to the diet. This is in line with the idea that older adults are especially motivated to master setbacks and losses (Ebner et al., 2006; Freund, 2006b).

Contrary to expectations, the improved self-regulation did not translate into more weight loss in older adults, although they reported higher behavioral control over eating behavior. This poses a problem for the present study as one could argue that older adults simply forget or ignore their dietary transgressions and hence feel happy without making actual progress towards their aspired weight loss. Regarding the affective experience, one could argue that, compared to younger adults, there is a disconnect between affect and goal attainment in older adults as they experience less negative affect in reactions to failure than younger adults. Goal theories maintain that negative affect is a necessary and adaptive reaction to setbacks because it provides feedback that the means employed to reach one's goal are either not appropriate or insufficient, thereby fostering reorientation and the investment of more effort into goal pursuit (Carver & Scheier, 1990; Martin et al., 1993). We argue, however, that the positive function of negative affect might be counteracted or even reversed in the case of failures in such long-term goals as dieting that require maintained efforts not to fall back into old habits, to resist temptation, and to deal with

fluctuations in the desired outcome (here, the aspired weight). Most people who embark on such a difficult endeavor deviate from their prescribed, new set of behaviors every now and then, and might experience less and less persistent progress towards their goal than they might have hoped for. In fact, the vast majority of participants (i.e., 122 out of 126 women) reported to have deviated from the diet over the course of study participation.

Experiencing negative affect again and again in response to these lapses from the diet could undermine goal engagement. In fact, several studies have shown that emotional arousal is a common reason to disrupt dietary restraint (e.g., Baucom & Aiken, 1981; Herman, Polivy, Lank, & Heatherton, 1987; McKenna, 1972). According to Herman and Polivy (1975), negative affect might undermine the diet as coping with one's mood might become more important than dietary success, thus taking attention and effort away from sticking to one's diet. Moreover, unfortunately, eating is one way of coping with distress in restrained eaters – even if the distress might be caused by dietary failure itself. Referring back to the study by Scheibe and Blanchard-Fields (2009), older adults appear to be more efficient emotion regulators of negative affect. These increased emotion-regulation skills might also have lead to lower levels of negative affect after failure in our study. According to Scheibe and Blanchard-Fields (2009), regulating affect is not as resource-demanding for older adults, which might enable them to pursue the concurrent goals of emotion regulation after failure and weight loss at the same time. Note also that the maintenance of a positive sense of competence and self in the face of failure to achieve one's goals is at the heart of Heckhausen and colleagues' motivational theory of life-span development (e.g., Heckhausen & Schulz, 1995; Heckhausen, Wrosch, & Schulz, 2010). As Heckhausen and colleagues stress, this might be particularly true in older adulthood.

With the data of the present study, we cannot rule out the possibility that there is a disconnect between affect and goal attainment in older adults. This seems unlikely, however, as the association of goal attainment in other life domains such as starting to exercise regularly and affective well-being is just as high in older as in younger adulthood (Riediger & Freund, 2004).

Alternatively, there might be a disconnect between affect and goal *pursuit*. Older adults might not react as strongly as younger adults to the “emotional challenges” of the diet. Note, however, that emotional reactivity is just as high in older as it is in younger adulthood provided the event is self-involving (Kunzmann & Grühn, 2005). We assume that this is the case in the current study as older adults rated their weight loss goal as no less important than younger adults. Age was not negatively related to the importance of goal attainment ( $r = .10, p = .28$ ). Moreover, age was unrelated to the intensity of anticipated positive affect from goal attainment ( $r = .06, p = .54$ ). Finally, another alternative explanation could be that older adults rank higher the importance of emotion regulation than other – even personally important – goals such as losing weight. Unfortunately, in the current study no information was attained on the importance of emotion regulation. Further studies are needed to rule out this alternative explanation.

The current study poses another interesting question: Why were older adults not more successful regarding actual weight loss? We submit that the reason might be one of a shifting caloric demand across adulthood, putting older adults in a more difficult position when it comes to weight loss. As the resting energy expenditure declines over the lifespan (Bosy-Westphal et al., 2003), it is more difficult for older adults than for younger adults to lose weight. The maximum caloric intake of 1200 kcal/day was assigned to all dieters irrespective of age. Even though they adhered more strictly to this goal than younger adults did, the caloric intake relative to the resting energy expenditure might have been higher for older than for younger adults, leading to less weight loss. This interpretation is supported by the result that reported deviations from the diet were more closely related to actual weight loss in younger than in older adults. The increasing gap between self-reported self-regulation and actual weight loss, then, might be due to changes in resting energy expenditure over the lifespan. In other words, even if keeping more strictly to the prescriptions of the diet, older adults might be less successful because, on average, they burn fewer calories than younger adults do. In fact, that age was not *negatively* correlated to actual weight loss could even be interpreted as indicating better self-regulation of eating during the diet.

This suggestion, however, is highly speculative. Further empirical studies including the assessment of resting energy expenditure in younger and older adults are needed to test this possible explanation.

Another unexpected finding concerns disinhibition, which did not emerge as a moderator of the relationship between age and weight loss. Despite its high face validity as an indicator of self-regulation, disinhibition was not strongly related to weight loss in general ( $Estimate = -.11$ ,  $SE = .04$ ,  $p < .01$ ). To rule out that this is a reliability or validity issue of the present measure of disinhibition, we conducted further analyses exploring whether disinhibition predicts a prominent indicator of self-regulation included in the present study, namely, self-efficacy. Attesting to its predictive power, disinhibition was significantly negatively related to the change in self-efficacy over the course of the six weeks of diet ( $Estimate = -.28$ ,  $SE = .05$ ,  $p < .001$ ; 12-item measure by Schwarzer & Renner, 2000; Cronbach's alphas at baseline and after the diet = .88 and .83, respectively). Interestingly, self-efficacy after dieting was positively correlated with weight loss ( $r = .48$ ,  $p < .001$ ). Disinhibition, then, seems to undermine one's beliefs that one can successfully pursue a diet and thereby indirectly affect weight loss.

Because the number of prior dieting attempts stochastically increases the likelihood of dieting success in the long run, we controlled for the number of previous dieting attempts. Number of previous dieting attempts only had an impact on disinhibition, positive affect, and negative affect (in multilevel models with deviations from the diet as predictor). This result speaks against a consistent practice effect of self-regulation skills in dieting. Another interpretation is that such task-specific skills might not be encompassing enough to help with the great variety of difficult situations that have to be mastered when going on a low-calorie diet.

### **Limitations and suggestions for research**

Generally, the reported age effects are small (all significant  $Estimates = |.03-.02|$ ). Note, however, that unlike many other age-comparative studies, we included a wide range of 58 adult years by examining participants from 19 to 77 years. This means that, for example, the difference

in self-reported deviations between the youngest and the oldest participant is  $58 \times .03 = 1.74$ , corresponding to one *SD* of this measure. This is, in fact, a substantial difference. Note also that the common use of extreme group comparisons, such as when comparing young and older adults, leads to an overestimation of standardized effect sizes (Preacher, Rucker, MacCullum & Nicewander, 2005).

Although we attempted to cover the entire adult life span, the oldest participant in our sample was only 77 years old. Hence, results cannot be applied to the oldest old. It might very well be that in the fourth age, self-regulation becomes seriously threatened by cognitive decline (e.g., inhibition). Furthermore, as study participation required women to be mobile enough to come to our laboratory and to be able to use a computer in order to read e-mails and answer a web-based survey, the sample is likely to be positively selected. Further research needs to extend the results by including a more heterogeneous sample with regard to health and education and the oldest old.

Another limitation refers to the age-correlative design. In such designs, age effects are confounded with cohort effects (Baltes, 1968; Schaie, 1965). At present, there is no empirical data on cohort effects in self-regulation. There is no apparent reason, however, to assume that older cohorts have better self-regulation skills. On the contrary, external regulation of individual behavior through institutional structures seems to have weakened over historical time, thus necessitating more self-regulation (Freund et al., 2009). Such a weakening might favor the acquisition of self-regulation skills in younger cohorts and would have worked against finding the age-related effects in the present study.

As discussed above, there is a gap between self-reported deviations from the diet and actual weight loss. This gap might be explained by changes in resting energy expenditure over the lifespan. However, without objective data on energy expenditure or eating behavior, it is impossible to refute the alternative explanation that older adults might have reported fewer deviations than actually took place. Deficits in remembering the number of transgressions or an

unwillingness to report them might contribute to such biased self-reports. To clarify this issue, it would be necessary and most interesting to include objective, behavioral data on energy expenditure and actual eating behavior in future studies. One possibility would be to combine a longitudinal self-report study on dieting with behavioral observations of dieters being confronted with tempting food. To rule out the possibility that older adults' higher affective well-being during the diet results from a disconnect between goal pursuit and affect, research would benefit from more event-based data on affective reactions to setbacks and on the importance of affect regulation as compared to the importance of the weight loss goals.

## **Conclusion**

In sum, our study supports previous findings on age-related improvements in self-regulation during the pursuit of personal goals (e.g., Riediger & Freund, 2006, 2008) such as weight loss. The reported improvement in the regulation of eating behavior, affect, and thought suggests that although laboratory research oftentimes shows decrements in executive control among older adults, complex behavior in the context of long-term goals is not necessarily impeded. Rather than that, older adults might be able to at least partly counteract such cognitive losses with an improved self-regulatory capacity. Accordingly, our findings contribute to the research showing that motivation is a domain of functioning in which gains are possible across adulthood.



## OVERALL DISCUSSION

The present thesis has addressed three major topics: the adaptiveness of process and outcome goal focus (Parts I and II), the life-span development of goal focus (Parts III and IV), and the life-span development of self-regulation (Part V). Firstly, I would like to briefly summarize and integrate the most important findings (see also Table 13). Thereafter, I shall discuss the findings in regards to their theoretical implications and make suggestions for future research directions. Finally, I will propose practical implications of the findings and draw the final conclusions.

### Summary and integration of the main findings

As reported in Part I, focusing on the process of dieting was directly and positively associated with self-regulation during a low-calorie diet and goal attainment. This was measured by weight loss. Additionally, process focus was indirectly related to higher subjective well-being and more successful weight loss via its positive association with self-regulation.

In Study 1 of Part II a process focus was positively related to both subjective well-being and to the intention of substituting means instead of outcomes after failure. Nevertheless, the intention to substitute means did not mediate the positive association of process focus and subjective well-being. Study 2 exemplified that in the context of dieting, process-related attributions were positively related to subjective well-being, the tendency to substitute means (compensation vs. disinhibition) after failure, and goal attainment, which was measured by weight loss. However, the results of Study 2 were not completely compatible with our hypotheses because either only attributions of success, or the combination of high attributions of both failure and success exhibited an impact on disinhibition, subjective well-being, and weight loss. Nevertheless, if process focus had an effect, it was always positive.

Part III reviewed the concept of goal focus from a life-span developmental perspective. We discussed why personal goals remain important across the entire adult life span, even though they may change in content and in their orientation from promoting gains to preventing losses.

## Overall Discussion

We hypothesized that it is a result of the changing goal orientation, the resource losses, and the shortening of future time perspective associated with older age that the representation of goals in older age changes from outcome to process focus.

Part IV provided multi-method empirical evidence for our hypothesized age-differences in goal focus. Overall, younger adults were more outcome-focused than older adults (Studies 1 and 2), who in turn, were more process-focused (Study 3). Additionally, our research suggests that process focus was beneficial and outcome focus maladaptive for affective well-being (Study 2, 3). Process focus made a positive effect on many goal variables, such as participants' perceived distance to their exercising goal, goal attainability, goal satisfaction, goal involvement, and goal importance. Outcome focus was either not influential or negatively associated with goal satisfaction and goal involvement. Surprisingly, a process focus supported only younger adults' goal-directed behavior (Study 3).

Finally, Part V investigated age differences in self-regulation during a low-calorie diet. As predicted, older women reported more successful self-regulation of behavior, affect, and thought during goal pursuit than younger women. More specifically, they reported less deviations from the diet and less disinhibited eating behavior, less rumination about lapses, and feelings of higher subjective well-being during goal pursuit. Nevertheless, older women did not lose more weight. This may be due to their lower level of resting energy expenditure.

As a result of these findings, the following four conclusions may be drawn: First, process focus was often positively associated with self-regulation, goal attainment and subjective well-being. Second, if outcome focus was correlated with self-regulation, goal attainment and subjective well-being, then the correlation was negative. Third, if age was related to goal focus, then it appeared to be associated with a shift from outcome to process focus across the adult life span. Fourth, age had a positive effect on self-regulation and subjective well-being during the pursuit of a weight loss goal.

Table 13: Summary of results

Hypothesis	IV/Predictor	DV/Criterion	Hypothesis confirmed?
<b>Part I, Context: Weight loss goal</b>			
A strong process focus is positively related to affective well-being.	Relative process focus	Positive affect Negative affect	Only indirect via self-regulation
A stronger process focus is positively related to self-regulation.	Relative process focus	Rumination Disinhibition Deviations from diet	Yes Yes Yes
A stronger process focus is positively related to goal attainment.	Relative process focus	Weight loss	Yes
<b>Part II, Study 1, Context: Idiosyncratic</b>			
A strong process focus is positively related to subjective well-being.	Relative process focus	Positive affect Life satisfaction	Yes Yes
A strong process focus is positively related to means instead of outcome substitution after failure.	Relative process focus	Means vs. outcome substitution	Yes
Means vs. outcome substitution after failure mediates the positive relation between process focus and subjective well-being.	Relative process focus Means vs. outcome substitution (Mediator)	Positive affect Life satisfaction	No No
<b>Part II, Study 2, Context: Weight loss goal</b>			
Strong process-related attributions of failure are positively related to affective well-being.	Relative process-related attributions of failure	Positive affect	Only in combination with strong process-related attributions of success
Strong process-related attributions of failure are positively related to means instead of outcome substitution after failure.	Relative process-related attributions of failure	Disinhibition vs. Compensation	No
Strong process-related attributions of failure are positively related to goal attainment.	Relative process-related attributions of failure (and success)	Weight loss	Only in combination with strong process-related attributions of success

## Overall Discussion

*Continuation of Table 13: Summary of results*

Hypotheses	IV/Predictor	DV/Criterion	Hypothesis confirmed?
<b>Part IV, Study 1, Context: Various goals</b>			
Younger adults focus on the outcome.	Age group (young vs. old)	Process focus and outcome focus	Yes
Older adults focus on the process.			No tendency for either focus
<b>Part IV, Study 2, Context: Thinking exercise (vacation goal)</b>			
Younger adults focus on the outcome.	Age group (young vs. old)	Process focus and outcome focus	Yes
Older adults focus on the process.			No tendency for either focus
Process focus increases positive affect.	Process focus and outcome focus	Positive affect Negative affect	Only in older adults
Outcome focus increases negative affect.			Only in younger adults
<b>Part IV, Study 3, Context: Exercising goal</b>			
Younger adults focus on the outcome.	Age group (young vs. old)	Process focus and outcome focus	No tendency for either focus
Older adults focus on the process.			Yes
Process focus predicts an increase in affective well-being and subjective indicators of successful goal pursuit.	Process focus and outcome focus	Positive affect Negative affect Various goal variables: distance to goal, attainability, satisfaction, involvement, importance	Yes Yes Partly
Outcome focus predicts a decrease in affective well-being and subjective indicators of successful goal pursuit.			
Process focus is beneficial for goal attainment.	Process focus and outcome focus	Exercise frequency Exercise regularity	Only for younger adults Only for younger adults
Outcome focus is maladaptive for goal attainment.		Exercise frequency Exercise regularity	No No
<b>Part V, Context: Weight loss goal</b>			
Self-regulation during goal pursuit improves across adulthood.	Age	Deviations Disinhibition Rumination Positive/negative affect Weight loss	Yes Yes Yes Yes No

### **Mechanisms of the adaptiveness of process focus**

In the present thesis, different operationalizations of goal focus were used. Outcome focus was operationalized via individuals' attributions of success and failure to the outcome (Part II, Study 2), by asking how much individuals think about the positive effects of outcome attainment (Part I, Part II, Study 1, Part III, Studies 1, 2), and by assessing how much goal pursuit was driven by a person's commitment to its desired outcomes (Part III, Study 3). Process focus was operationalized via individuals' attributions of success and failure to the means (Part II, Study 2), by asking how much individuals think about what they can do to pursue their goals (Part I, Part II, Study 1, Part III, Studies 1, 2), and by assessing how much goal pursuit was driven by a person's commitment to its means (Part III, Study 3). These alternative operationalizations have provided converging evidence for the adaptiveness of process focus for self-regulation as compared to outcome focus and captured different mechanisms. The various operationalizations that we incorporated in this work have functioned to capture different mechanisms of goal pursuit. They also highlight the necessity of deeper investigation into the mechanisms, which, in turn, render each aspect of process focus and outcome focus as adaptive or maladaptive, respectively.

### **Discrepancies between states or actions**

First, I would like to emphasize that an outcome focus is detrimental: it draws an individual's attention to the discrepancy between the actual and the desired outcome state but not to discrepancies in actions, for example, the representation of what still needs to be done and which means need to be implemented in order to attain the goal. The detrimental effect of an outcome focus mechanism has best been captured in studies that operationalized process focus as how much individuals consider what they can do to pursue their goals and outcome focus as how much individuals consider the desired end state (Part I; Part II, Study 1; Part III, Studies 1 and 2). The operationalization via attributions of success and failure that referred to the process and to the outcome have clearly alluded to perceived discrepancies between the actual and the

desired state (outcome-related attributions) as compared to perceived discrepancies in actions (process-related attributions; Part II, Study 2). How could the perception of discrepancies between states be less adaptive than the perceived discrepancies between actions?

Many theories of motivation assume that people are motivated to pursue their goals simply because they perceive a discrepancy between their actual state and the desired outcome state. Discrepancy theories of motivation predict that in order to reduce this discrepancy people will take the necessary actions. For example, Carver and Scheier's cybernetic control model (e.g., 1981, 1990, 1998) posits that people monitor their rate of discrepancy reduction towards the desired end state. If goal progress is below a criterion that refers to an acceptable or desired rate of behavioral discrepancy reduction, then, negative affect arises; consequently, actions are taken to reduce the negative affect and to speed up discrepancy reduction. If goal progress exceeds the criterion, then, positive affect arises and motivation to pursue further action decreases.<sup>6</sup> Other discrepancy theorists of motivation have also concluded that perceiving the discrepancy between the actual state and the desired state as salient results in an increase in an individual's motivation to pursue a goal (e.g., Higgins, 1987; Hull, 1934; Lewin, 1938, 1951; Locke & Latham, 1990; Miller et al., 1960).

If creating a discrepancy towards a desired outcome and placing greater value on the outcome state increases motivation, then how can an outcome focus be maladaptive? I posit that in addition to being comprised of the perception of a discrepancy between the actual and the desired outcome state, and by a high desirability of the outcome state, successful goal-directed behavior also requires the cognitive representation of a discrepancy on the level of means. That is, a discrepancy between what has been previously done in order to pursue the goal and what still needs to be done in the future to reach the goal. Accordingly, possessing a process focus and

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<sup>6</sup> This might hold in particular in a multiple goal context, when people have to allocate their resources between different goals at a time (Fishbach & Dhar, 2003; Fishbach, 2009).

focusing on means that can and need to be used in order to pursue the goal should be more beneficial than using an outcome focus.

The claim that it is not beneficial to focus on the discrepancy between the actual state and the goal end state without also pondering representations of the means to overcome the discrepancy is in agreement with the results presented in the thesis. It is also in line with Kuhl's theory of action vs. state orientation (1985). This theory distinguishes between two regulatory states during goal pursuit: First, in an *action orientation* state people focus on a fully developed action structure. This action structure includes both the discrepancy between a present state and a desired future state *and* the action alternatives, which may transform the present state into the future state. In contrast, a *state orientation* is characterized by thoughts about some particular state that may be the present state, a past state, a future state, or even absentmindedness. Therefore, a state orientation entails incomplete representations of the intentional action structure; it does not include a representation of actions that can lead from the current state to the desired outcome state. If only a discrepancy between states is represented and this discrepancy is not traced back to the need for specific behaviors to reduce it, then effective goal pursuit may be impeded (see Kuhl & Beckmann, 1994).

### **Fantasizing about outcome attainment**

In this thesis outcome focus has on average not been operationalized directly as the perception of a discrepancy between the actual and the outcome state. Nevertheless, this work has captured how much people reflect upon what it would be like for them if the discrepancy between the actual state and the goal end state were to be reduced (Part I; Part II, Study 1; Part III, Studies 1, 2). This operationalization captures a second mechanism that might render an outcome focus maladaptive, namely, fantasizing about future outcome goal achievements. As research pertaining to fantasy suggests (Oettingen & Hagenah, 2005; Oettingen & Mayer, 2002; Oettingen & Thorpe, 2006), people who fantasize about how great achieving a desired outcome will exhibit low motivation to actually engage in goal pursuit. This may be a result of their

fantasies serving as substitutions for actual goal attainment. Hence, imagining outcome attainment may, in actuality, impede the “call to action” needed to reduce discrepancy. This line of reasoning is also supported by research pertaining to the maladaptive effects of outcome focus in mental simulations (Pham and Taylor, 1999). Moreover, Goodhart (1986) has also reported the negative effects resulting from positive task-related thoughts or images on actual performance in an anagram task (in contrast to negative task-related thoughts). However, such negative effects were only observed in people who had not been asked to judge their past performance prior to solving the task and who in turn did not make inferences about the expectancy of outcome attainment. Obviously, merely thinking about how great outcome attainment could possibly be has positive effects on subsequent affect but such fantasy does not lead to instrumental behavior. However, outcome thinking might lead to instrumental behavior if it involves considering not only the outcome value but also outcome expectancy. If expectancy of outcome attainment is pondered, then people might be influenced to also start thinking about the road to success. Accordingly, people may make preparations for possible future setbacks and obstacles. In sum, thinking about outcome attainment may lead to effortful action and successful performance when it is based on expectancy judgments. In contrast, positive fantasies about future outcome attainments could impede effortful action and successful performance (Oettingen & Hagenah, 2005; Oettingen & Mayer, 2002; Oettingen & Thorpe, 2006).

### **Delay of gratification and intrinsic vs. extrinsic motivation**

In Study 3 of Part IV, process focus has been operationalized by using a third type of methodology, namely, assessing how much individuals value the means of goal pursuit and are committed to them (e.g., having fun during exercising), as compared to the outcomes of goal attainment (e.g., weight loss). Our results evidenced that valuing the means and seeking enjoyment during the process of goal pursuit exhibited more positive effects on goal involvement and actual goal pursuit than by merely placing primary value on the future outcomes of goal attainment. This result converges with research on extrinsic versus intrinsic motivation (Deci &



Ryan, 1985; Kruglanski, 1975; Ryan, Sheldon, Kasser, & Deci, 1996). If people are extrinsically motivated, then the reward for which they are aiming is contingent upon successful completion of the actions necessary for goal attainment. If people are intrinsically motivated, then the reward is an inherent part of engaging in the goal-directed action. As previously mentioned, being intrinsically motivated oftentimes leads to voluntary involvement, more interest in the goal, and higher persistence in a task (Deci et al., 1999; Krapp, 2005, Lepper, 1981).

Additionally, individuals who are able to value the process do not have to delay gratification (Mischel et al., 1996; Mischel, Shoda, & Rodriguez, 1989). In contrast, if the outcome is valued higher than the process, then gratification occurs only when the outcome is achieved. Until this takes place, one must be able to delay gratification. Since goal pursuit usually extends over longer periods than the effects of outcome attainment (Frederick & Loewenstein, 1999), being able to appreciate the path towards the eventual goal attainment should save an individual from short-term temptations that are in conflict with the long-term gratification involved in outcome attainment.

An outcome focus might be maladaptive because of the following three reasons: First, perceiving a discrepancy between the present and the desired outcome state alone may not result in instrumental behavior. This may be the case if it is not accompanied by both the perception of discrepancy on the level of means and a contemplation of how to overcome state discrepancies. Second, an outcome focus might also be maladaptive because it can lead to fantasizing about goal attainment; however, this can serve as a substitution, which hinders people from putting real effort into goal pursuit (Oettingen & Mayer, 2002). Third, undoubtedly, being committed to the outcome without valuing the means requires the delay of gratification whereas being able to value the process more than outcome can result in the aforementioned beneficial effects of intrinsic motivation, for it does not require the delay of gratification. As a consequence, pursuing goals with a process focus in mind should require less self-regulation than pursuing goals with an outcome focus.

### **Determinants of the adaptiveness of process versus outcome focus**

Thus far, we have discussed various mechanisms that might render a process focus more beneficial than an outcome focus. Nevertheless, the maladaptiveness of outcome focus or the adaptiveness of process focus may be determined by alternative factors. This leads us to the following inquiry: Which moderators or context variables influence the adaptiveness of either focus?

#### **Time orientation**

Until now, we have characterized outcome focus as a focus on the goal-related outcomes that one wishes to attain in the *future*. However, it is possible for an individual to also focus on outcomes or subgoals that have already been attained in the *past*. Contrastingly, rather than thinking about the discrepancy of the actual and the desired state, it is possible for one to pay attention to what has previously been accomplished, i.e., the discrepancy between a past state and the current state that has already been overcome. Does one's time orientation produce differences pertaining to the effect that outcome focus produces on self-regulation? I propose that it is receiving feedback regarding what has already been attained (e.g., "You have reached 50 % of your exercise goal."), as opposed to receiving feedback on the distance to achieving a desired end state (e.g., "You are 50 % away from your exercise goal.") that results in a greater reduction in motivation. According to Amir and Ariely (2008), reaching a subgoal may generate a sense of achievement and be followed by a period of complacency. This sense of achievement in the face of a subgoal acquisition would not be generated in alternative conditions, in which the distance to the end state is the main focus of one's attention.

Similarly, when people attend to processes of goal pursuit, they are also able to choose to focus either on the remaining actions or, on the already completed actions. Koo and Fishbach (2010) propose the following: Focusing on the remaining actions increases one's motivation to reach a more advanced level whereas placing one's focus on already completed (vs. remaining) actions increases the satisfaction derived from the current position. Based on their previous

research, Fishbach and colleagues (Fishbach, Dhar, & Zhang, 2006; Koo & Fishbach, 2008) argue that placing an emphasis on the remaining actions that are needed helps individuals to direct their attention towards making progress, for this leads to a desire to “move up in the goal ladder.” In contrast, placing an emphasis on already completed actions influences individuals to focus on their commitment to the current goal because they infer commitment from their past investment of effort, and as a consequence desire to repeat the present goal level. Therefore, focusing on actions awaiting completion may lead to higher performance than focusing on previously completed actions.

### **Action phase**

The results of this thesis have attested to the adaptiveness of process focus during the *pursuit* of personal goals. Nevertheless, a process focus might not be most adaptive for goal *setting*. In order to choose the correct goal, it is necessary to compare both the desirability and attainability of one goal's end result with another goal's end result. Accordingly, when setting goals, having an outcome focus might be more beneficial (see also Gollwitzer, 1996; Gollwitzer, et al., 1990).

### **Rigidity of goal focus**

Our results suggest that process thinking seems to foster self-regulation, yet this relation might not be linear. Having a very strong or rigid process focus might not be adaptive. This is reflected in the following proverb: “Not seeing the forest for the trees”, which means focusing on the single steps of goal pursuit whilst forgoing the “big picture.” This can influence individuals to lose track of where they are heading and lead them to pursue goals, which might not even be desirable or attainable anymore. In contrast, re-evaluating the desirability and the attainability of a goal's outcome at various intervals could ensure that the chosen path still points in the correct direction. Even though concrete means or subgoals might be a strong guide for actions, in contrast to an outcome focus, they might lack the ability to provide an individual with a sense of purpose, meaning or direction in life (see also Little, 1989; Klinger, 1977).

In addition, a rigid process focus might put people in danger of failing to meet deadlines for achieving their desired outcome. For example, a person might fail to recognize that the day of an exam is fast approaching because he or she is completely absorbed in activities, such as, planning the best way to prepare, collecting material, and reviewing various learning strategies.

### **Task aversiveness**

Thinking about means without keeping “the prize” in mind might reduce motivation when the means of goal pursuit are highly aversive. During situations, in which procrastination occurs, it might be useful to consider aversive means primarily as means to an end (Blunt & Pychyl, 2000).

### **The structure of the goal system**

Interestingly, if process attributions of failure foster means substitution after failure, their adaptiveness might only exist as long as the goal system offers the possibility to substitute a current means. Hence, it is only in situations, in which equifinality is implied in the means-outcome-interconnection that it becomes possible for an individual to benefit from focusing on the means level. Otherwise, focusing on the level of outcomes and then determining other desirable and more attainable outcomes becomes necessary (see also Wrosch et al., 2003; Wrosch et al., 2007).

### **Future research directions**

*A difference score for relative process focus.* In Parts I and II, we have operationalized goal focus as the relative focus on the process as compared to the outcome. We have calculated a difference score indicating an individuals’ relative process focus. Accordingly, we level out the main effects of outcome and process focus as separate variables to investigate the effects of a discrepancy in goal focus. From a theoretical viewpoint, we consider this to be the most straightforward approach to the data. We have expected that process and outcome focus are positively related. Theoretically, activation spreads within a goal system, both top-down from the outcomes to the means, as well as bottom-up from the means to the outcomes (Shah & Kruglanski, 2002; 2003).

Hence, thinking about means should to some degree co-activate thinking about outcomes and vice versa. Our data confirms this expectation: In the dieting study presented in Parts I and II, outcome and process focus were positively correlated with  $r = .73$  ( $p < .001$ ), process and outcome attributions of failure were correlated with  $r = .61$  ( $p < .001$ ), and process and outcome attributions of success were correlated with  $r = .60$  ( $p < .001$ ). In Study 1 of Part II, outcome and process focus were correlated with  $r = .56$  ( $p < .001$ ). We expect the overall level of activation of means and outcomes to primarily reflect the importance of the target goal at a given time. As a consequence, individuals who score high on both their outcome and their process focus may be successful in self-regulating their goal-directed behavior just because their goal is very important to them. In contrast, individuals who score low on both their outcome and their process focus may not be successful in self-regulating their goal-directed behavior just because their goal is not very important to them at all. Accordingly, instead of looking at these relatively uninteresting high process/high outcome focus and low process/low outcome focus combinations, we wanted to concentrate primarily on the high process/low outcome focus and the low process/high outcome focus combinations by calculating a score for an individual's relative process focus. Our question was: To which degree is having a stronger process than outcome focus beneficial for self-regulation and subjective well-being?

Difference scores have been criticized for being less reliable than their component scores (e.g., Johns, 1981; Lord, 1958; but see Ragosa & Willet, 1983). Accordingly, even though using the difference score is well justified from a theoretical perspective, we may consider other methodological approaches in the future. Peter, Churchill, and Brown (1993) have proposed two alternatives to the use of difference scores. First, they recommend to use a direct comparison operationalization of the proposed difference score construct. For example, Tse and Wilton (1988, p. 206) asked participants to rate how closely a product did come to their expectation instead of using a difference score between the participants' expected and actual satisfaction with the product. However, we think that individuals usually do not think about the extent to which

they focus on the process more than on the outcome. Consequently, asking them to mentally consider an arithmetic difference between the two foci themselves could produce an artificial and even more unreliable measure. Second, Peter et al. recommend the reframing of research questions to avoid using difference scores. This recommendation might be a more useful approach to our data. For example, it might be interesting to investigate the extent to which a process focus adds incrementally to the prediction of self-regulation by outcome focus. This way, we could partial out the correlation of process and outcome focus by using hierarchical regression analyses and adding outcome focus and process focus stepwise as separate predictors.

However, as a final note on this topic, we would like to maintain that the difference scores we used as indicators for goal focus seem to be reliable over time (Cronbach's alpha for relative process focus in the dieting study = .71; for relative process-related attributions of failure = .78, for relative process-related attributions of success = .85). Hence, they might not suffer from reliability issues to a huge extent.

*Social-cognitive paradigms.* It is imperative to emphasize that particular portions of this thesis (Parts I and II) are based on correlational designs that investigated the associations between goal focus, self-regulation, and subjective well-being. Accordingly, we cannot simply infer causal effects. However, as already mentioned, previous research suggests that if individuals are in a positive mood, receive success feedback, and perceive goal pursuit as easy, then they tend to adopt an outcome or generally more abstract focus (Basso, Schefft, Ris, & Dember, 1996; Gasper & Clore, 2002; Ketelaar & Clore, unpublished, cited after Clore et al., 2001; Vallacher & Wegner, 1989; Wegner & Vallacher, 1986). In contrast, when goal pursuit is perceived as difficult, negative feedback is given, and negative affect arises, then people tend to switch their focus from an outcome to a process focus. Nevertheless, more experimental studies are needed in order to replicate these findings, which could lend further support to the hypothesis that process, not outcome focus leads to both instrumental self-regulatory behavior and higher subjective well-being during goal pursuit.

Future experimental research should apply social-cognitive paradigms that capture different stages of information processing. Besides the work presented in this thesis, we have already started the search for appropriate paradigms that can manipulate or capture participants' goal focus and its cognitive, behavioral and affective consequences. For example, we have used a paradigm that captured how much participants attended to means- versus outcome-related information before they were to decide between two different trainings of cognitive ability. We have also used paradigms to capture the cognitive accessibility of means versus outcomes: In an incidental memory paradigm, participants had to recall actions they previously had categorized as either means to a goal or desired outcomes of a goal (for a discussion of incidental memory performance as a measure of cognitive accessibility, see Anderson & Bower, 1972). Moreover, we have used a fluency measure as an indicator of goal focus, when asking participants to generate either means or desired outcomes of their personal goals and counting the number of means- versus outcome-related responses. To target the higher behavioral level of social-cognitive information processing, we have also combined priming paradigms with forced-choice attribution and decision making tasks. In a very elaborate study, we investigated the consequences of age and goal focus after failure in the goal to improve one's social competence. Goal focus was primed by asking young ( $n = 43$ , 20-29 years,  $M = 22.1$ ,  $SD = 2.2$ ), middle-aged ( $n = 11$ , 45-55 years,  $M = 51.0$ ,  $SD = 3.2$ ) and old participants ( $n = 11$ , 65-80 years,  $M = 72.3$ ,  $SD = 5.1$ ) to name either means (process focus) or desired outcomes (outcome focus) of improving one's social competence. In a pilot study, this manipulation had significant effects on goal focus as measured with the questionnaire also used in Study 1 of Part IV ( $F(1,86) = 4.89$ ,  $p = .03$ ). After the manipulation, participants started a training of social competence, in which two outcomes (improving social speed and social accuracy) could be attained by two means (training methods) each. During the pursuit of the first outcome with the first training method, failure was induced. Attribution of failure was assessed by letting the participants decide on the reason for their failure, whether a) the method was not useful for improving social accuracy (attribution to

the means) or b) improving social accuracy is a difficult goal to pursue (attribution to the outcome). To assess behavioral reactions, participants decided to either continue pursuing the same goal with another means (means substitution) or to pursue another goal instead (outcome substitution). Positive affect (Steyer et al., 1997) was assessed to test the hypothesis that the substitution of means is less detrimental to well being than outcome substitution and the disengagement from the target outcome. The results showed that two goal focus measures (the goal focus questionnaire and a more specific, domain-related measure) were not reliable for the measurement of a change in goal focus, rather an unwanted interaction of the questionnaire version with the goal focus manipulation has been found ( $F(1,58) = 4.67, p < .05$ ).

So far, the experimental manipulations and measures of goal focus have not yielded reliable results. Nevertheless, we view the results presented in this thesis as encouraging. This dissertation thesis may establish the basis for a future experimental research program dedicated to investigating the effects of goal focus on self-regulation.

### **Process and outcome focus across the life span**

Until now, the common view regarding action or goal representations has implied that people usually focus more on the outcomes of their behavior than on the processes (Vallacher & Wegner, 1989). However, the present thesis provides evidence that this position entails an oversimplification, which is due to research involving only young research participants. Parts III and IV attest that older adults are more process- than outcome-focused.

### **The adaptiveness of process focus across the life span**

Interestingly, the evidence produced by this thesis suggests that younger adults' focus on outcomes proved to be maladaptive. In contrast, a process focus was generally more adaptive when people pursued goals, such as, losing weight or starting a regular exercise program. In Study 3 of Part IV, younger adults benefitted more than older adults from possessing a process focus. Thus, the following question, from a functional perspective, emerges: Why would younger adults adopt a goal focus that is not beneficial?



As previously argued, the developmental tasks of young adults are especially outcome-oriented, e.g., younger adults can aim to finish university with a certain degree, find a job, find a partner, or build a house. Before being able to pursue these goals, younger adults are faced with many important life decisions. They have to decide which course of studies they would like to pursue, in which field they would like to work, or which town they would like to live in. The outcomes that they consider as desirable and attainable will shape their subsequent lives. Accordingly, setting “correct” goals is essential in young adulthood. During goal setting, people focus on the outcomes of possible goals, their positive and negative consequences on the short- and the long-term, as well as the likelihood of the goal being attained in the future (Gollwitzer, 1990; Gollwitzer et al., 1990). Hence, younger adults’ stronger outcome focus may not only result from the developmental tasks ahead of them but could also be adaptive when choosing the particular outcomes that fulfill these tasks in the best possible way. Typically, older adults do not have to make such important life decisions anymore, and they seem to continue on the life paths that they have selected in the past. Perhaps, a process focus is most adaptive in the pursuit of goals. Contrastingly, when setting goals, an outcome focus might be more important.

Finally, I would like to stress that the present research does not only examine age-differences in goal focus, but it also points to the importance of not relying on student samples when trying to make inferences on the population. The idea that within-person processes can be studied in samples of students (Johnson, 2010) cannot be accepted, unless researchers can be *sure* that individual characteristics such as age do not interact with the variables being studied. As we have shown in Part IV, both goal foci have differential consequences in younger, as opposed to older adults.

### **Future research directions**

In Part III, the effects of age on goal focus and the mechanisms that might drive the shift from outcome to process focus in old age have been discussed. Several mechanisms that explain this shift in goal focus have been proposed, namely, resource restrictions, a restricted future life

perspective, and changing goal orientation from one of promoting gains to one of preventing losses (or from change to stability). Insofar, the present work has provided a firm theoretical basis for investigating these mechanisms in more detail; it has not provided empirical support for these mechanisms. This shortcoming could be addressed in future research as follows:

First, the effects of future time perspective on goal focus could be investigated by manipulating future time perspective (e.g., Fredrickson & Carstensen, 1990; Fung, Carstensen, & Lutz, 1999). If future time perspective is one of the driving forces behind the shift from outcome to process focus in old age, then a process focus should also be more predominant in younger adults with a short future time perspective whereas an outcome focus should be predominant in older adults with a more extended future time perspective. Second, the role of resource availability should be investigated. Would younger adults also be more process-focused when they perceive their personal resources as constrained? The evidence from a study by Vallacher et al. (1989) already points in this direction, though facing a task with high technical difficulty may not have the same effects on goal focus as the subjective perception of low personal resources. Another area for further exploration is goal orientation towards promoting gains versus compensating losses and how goal orientation might be manipulated, e.g., by having participants pursue goals that are framed in the respective goal orientation (e.g., Freund, 2006b).

### **Self-regulation across the life span**

The present thesis has adopted a life-span approach to the study of self-regulation. It has shown that older adults are more process-focused than younger adults and that this goal focus is generally beneficial for self-regulation during the pursuit of personal goals. Aside from the beneficial effects of age on goal focus and subsequent self-regulation, it suggests that self-regulation might be a domain, in which gains in old age are still possible. This result is in line with one of the central tenets of life-span developmental psychology, that is, the tenet of multidirectionality (Baltes, 1987): Although functional losses in old age might be inevitable in some domains, such as, physical health or fluid intelligence (Baltes, 1997; Salthouse, 1991; Schaie,

1995), self-regulation appears to improve into the third age. In the section that follows, I shall discuss why self-regulation is so important for successful development in general and especially in old age.

### **The importance of self-regulation for developmental regulation**

Models of developmental regulation strongly emphasize the personal agency (Baltes & Baltes, 1986; Baltes et al., 1998; Brandstädter, 1998; Lerner & Busch-Rossnagel, 1981) and the context-sensitive flexibility (e.g., Heckhausen, 1999; Brandstädter & Renner, 1990) by which people adapt to changes in their life-course opportunities. The model of selective optimization with compensation (Baltes & Baltes, 1990; Freund, 2007; Freund & Baltes, 1998), the dual-process model of assimilative and accommodative coping (Brandstädter, 2006; Brandstädter & Renner, 1990), as well as the life-span theory of control (Heckhausen & Schulz, 1995; more recently advanced as the motivational theory of life-span development: Heckhausen et al., 2010) all share the assumption that people adapt to changes in opportunity structures and resource constraints presented during their life-course. Individuals do this by anticipating opportunities, implementing strategies of goal engagement, disengaging from goals that have become too costly, and by replacing them with other, more attainable goals. These three models primarily focus on developmental goals that are relatively abstract and long-term goals such as “becoming a lawyer” or “having a family” (Heckhausen & Schulz, 1998).

To reiterate, the pursuit of long-term goals requires self-regulation, that is, the capacity to control one’s thoughts, to manage one’s emotions, to overcome one’s unwanted impulses, to fix one’s attention to the goals that should guide one’s behavior, and to make choices (Baumeister et al., 2007). Accordingly, self-regulation and developmental regulation are closely intertwined by the setting and pursuit of personal goals. Goal-directed behavior, such as, the compensation of lapses, the optimization of goal pursuit, or the loss-based selection of other goals (Baltes & Baltes, 1990; Freund & Baltes, 1998) all draw on the capacity to self-regulate (Baumeister et al.,

2007). In other words, self-regulation is a prerequisite for goal pursuit in the service of developmental regulation (see also Wrosch & Freund, 2001).

Why might self-regulation be especially important in old age? As Freund et al. (2009) have stated developmental regulation has an external component outside of the “self.” In addition to being controlled by the agentic self, developmental regulation is also controlled by the external world’s social norms and expectations. When external control is high, the agentic self does not have to (or cannot) play its leading role in development. In childhood, adolescence, young and middle adulthood, external regulation may have a strong impact on how people set and pursue personal goals via social norms and expectations. For example, organizational structures reinforce successful goal attainment with external incentive structures, such as, promotions, salary increases, or appreciation by supervisors. In young adulthood social norms and expectations strongly guide the selection and pursuit of goals. Conversely, there is a stronger emphasis on involvement in rather poorly defined life domains after retirement. In domains, such as, leisure and social relations, there exist fewer social expectations pertaining to the kind of goals an adult should attain, as well as little external reinforcement (or punishment) by external incentive structures. As external control decreases in old age, older adults have to play a more active role, in order to compensate for the lack of social structures and norms after retirement; self-regulation becomes especially important for successful developmental regulation in old age (see also Wrosch & Freund, 2001; Freund et al., 2009).

Self-regulatory processes may be especially important in old age because they help older adults to adapt to age-related resource losses (e.g., functional declines or chronic diseases; Baltes, 1987; Brock, Guralnick, & Brody, 1990; Wrosch & Freund, 2001). Resilience in old age can be achieved when the effects of resource losses are counteracted by the use of self-regulatory processes. This can result in the protection of an individual’s subjective well-being or the perception of internal control (Lachman, 1986; Ryff, 1989; Baltes & Baltes, 1990; Freund & Baltes, 1998; Wrosch et al., 2000).

### Mediators of the effect of age on self-regulation

Self-regulation in old age is not only very important. As Part V has shown, but it also works very well, even better than it does in younger adulthood. This empirical evidence forms a strong argument that older adults' possess the ability to compensate for the loss of external control that is seen in late adulthood. Mechanisms that may lead to the improvement of self-regulation in old age have already been discussed in Part V. It is imperative to explore these mechanisms in more detail and to propose additional variables that mediate the effects of age on self-regulation.

*Executive functions.* One possible mediating mechanism for the effects of age on self-regulation, which has already been addressed in Part V, is inhibitory control. We have inferred from previous research dedicated to executive functions that the ability to inhibit responses declines in old age (Verhaeghen & Cerella, 2002). However, the attainment of long-term goals should depend more on an individual's motivation for goal pursuit and other context-dependent moderators than on task performance in a test of executive functions. Hence, self-regulation during long-term goal pursuit should not be entirely predictable by using measurements obtained from tests of inhibitory executive functions. A recent study by Hofmann et al. (2009) attests that measures of attention control and inhibitory control do not correlate with self-regulating eating behavior ( $r = -.02$  and  $.06$ , respectively). However, affect regulation has proven to be a crucial factor that suppresses the negative effects of inhibitory control on self-regulation to withstand the temptation presented by delicious food (see also Nederkoorn, Houben, Hofmann, Roefs, & Jansen, 2010). Older adults are very successful in regulating their affect (e.g., Gross et al., 1997; Phillips et al., 2006; Scheibe & Blanchard-Fields, 2009). Accordingly, if they are motivated to do so, then they might be able to compensate for their decline in executive functions. Hence, affect regulation should not only be considered as a component of self-regulation (Baumeister et al., 2007) that is relatively unaffected (or even improved) by age; it should also be considered as a moderator of the effects of inhibitory control on self-regulation.

Self-regulation also includes deliberative strategic efforts that are initially devised to avoid situations, in which a person must rely on his or her inhibitory capacity to avoid tempting situations, e.g., by planning grocery shopping more intensely. By using this strategy, older adults may compensate for the decline in their executive functions. The use of such compensatory strategies could moderate the effects of executive functions on self-regulation in old age.

In summary, future studies should address the role of executive functions in a more systematic fashion, e.g., by investigating how well results from tests of executive functioning predict self-regulation during long-term goal pursuit. Specifically, moderators that influence the contributions of executive functions on self-regulation need to be identified, in order to shed light on the mechanisms older adults use for compensating losses in their executive functioning.

*Practice.* As discussed in Part V, practice effects of self-regulation might also mediate the positive influence of age on self-regulation (Muraven et al., 1999). Research on executive functions also suggests that inhibition can be trained in older people (Dahlin, Nyberg, Backman, & Neely, 2008). Unfortunately, we cannot directly test the contribution made by practice effects. In Part V, we assessed prior dieting attempts within the last two years, in order to obtain a measure that is uncorrelated with age. However, this measure may reflect short-lived practice effects. Indeed, the study produced evidence that dieting attempts within the last two years were positively related to rumination after lapses, disinhibition after lapses, and positive affect during the diet.

*Goal orientation.* An individual needs to be motivated to set and pursue a goal that requires self-regulation. As suggested by Ebner et al. (2006), personal goal orientation to either promote gains, or balance losses plays an important role for setting personal goals. As Freund (2006b) discovered, there are age-differences in engagement during goal pursuit. These age differences depend on whether gains can be achieved, or if compensatory processes to counteract losses are required. We have argued that older adults' stronger motivation to counteract losses is one mechanism that promotes successful compensation and self-regulation after lapses (Ebner et al.,

2006; Freund, 2006b). In a similar way then, should (younger adults') motivation to achieve gains promote self-regulation when possible gains loom. Accordingly, younger adults might be especially motivated to self-regulate their thought, affect, and behavior when goal pursuit requires primarily optimization processes whereas older adults might be especially motivated to self-regulate their thought, affect, and behavior when goal pursuit requires compensatory processes (Freund, 2006b).

*Goal focus.* Parts I through IV suggest, that process goal focus may also mediate the positive age effect on self-regulation during goal pursuit. As reported in Parts III and IV, older adults are more process-focused than younger adults.

*Future time perspective.* Does the age-related shortening of future time perspective have an effect on self-regulation across the adult lifespan? Undoubtedly, delay of gratification is essential for self-regulation and requires the mental representation of a future, in which one can become gratified (Mischel et al., 1996; Mischel et al., 1989; Zimbardo & Boyd, 1999). This leads me to the following question: Could a short future time perspective in old age impair self-regulation during goal pursuit?

This is doubtful because of the following reasons: It is unlikely that older adults, unless they are severely ill, have a future time perspective that is so short that it does not allow for the pursuit of personal goals. Across adulthood goals might change in their content (Carstensen et al., 1999), but older adults do pursue personal, long-term goals (Freund & Riediger, 2006) that often require the delay of gratification. Older adults might intentionally set and pursue goals that help to increase their future time perspective, that is, in the domains of health and physical functioning. Hence, the shortening of future time perspective in old age may increase the motivation to delay gratification for the sake of such goals. Due to the enormous increase of life expectancy during the past 160 years (Oeppen & Vaupel, 2002), the third and fourth age provide much more time for the pursuit of long-term goals that requires self-regulation (Freund et al., 2009).

### **Future research directions**

Field studies have high ecological validity for the study of self-regulation. Nevertheless, this methodology lacks the controllability of experimental research. Thus, it is important to combine experimental research with longitudinal field studies in domains that are relevant to older adults. However, this poses a methodological challenge because it requires the comparison of behavioral, affective, and cognitive self-regulation between younger and older adults during goal pursuit under the premise that goals change across the adult life span. In order to generalize our results from the dieting study to the general population, it would be necessary to identify more goal domains that allow for the comparison of younger, middle-aged, and older adults. Investigating other health- or leisure-related goals (e.g., exercising) that are pursued by younger, middle-aged, and older adults might prove useful for this purpose. Measurement invariance is the extent to which items or tests have the same meaning across groups of examinees (Horn & McArdle, 2002), and should also be considered when choosing techniques for the assessment of self-regulatory processes. Finally, as already discussed in Part V, longitudinal studies should exclude the confounding of age and cohort effects on self-regulation.

### **Practical implications**

This thesis contributes to basic research on self-regulation during goal pursuit. It entails two findings with strong practical implications: First, when people pursue personal goals they benefit from focusing on the means of goal pursuit rather than on the outcomes. Second, self-regulation seems to be improved with practice (see also Muraven et al., 1999). How can these findings be practically applied?

If a process focus is more adaptive for goal pursuit, then institutions that accompany people who are pursuing goals should make use of this result. For example, weight loss programs should try to influence dieters to think about the means of dieting rather than imagining how great being slimmer would be. However, no such useful manipulations of goal focus for dieting programs have yet been developed; nonetheless, this might be a useful task for the future.



Evidence from an educational research perspective suggests that students' process focus can be strengthened by relatively simple mental simulations (Pham & Taylor, 1999), and that such mental simulations of the processes involved in goal pursuit have a positive impact on performance. Furthermore, feedback that is given during goal pursuit should evaluate the means of goal pursuit rather than only identifying the subgoals that already have been attained (see also Amir & Ariely, 2008). As presented in Part II, attributions of both success and failure to the means of goal pursuit foster goal attainment. Organizations and educational institutions should consider this empirical evidence in the future, in order to improve the performance of those who receive feedback.

If self-regulation can be enhanced by practice, then this has strong implications. For example, people who have repeatedly attempted to quit smoking, lose weight, or maintain an exercise regime should be encouraged (individually or institutionally) to not give up on such goals because with each attempt the likelihood of eventually being successful increases. Raising public awareness that self-regulation is malleable rather than a fixed trait could have a positive impact. If self-regulation can be improved by practice, then doing so might be a better strategy than imposing strong external regulation. For example, parents with children who have self-regulation problems at school should, in addition to imposing strict rules, external monitoring, and reinforcement strategies on their children, provide their children with encouragement to practice self-regulation in other domains. Playing sports, joining a youth club, or playing an instrument might help children and adolescents to improve their self-regulatory capacity. For example, children might learn to be persistent, to attend their lessons, or to participate in meetings regularly, even though they may wish to do other things. In this way, the practice effects of self-regulation could be transferred from these aforementioned alternative domains to the school domain (Muraven et al., 1999).

### **Conclusion**

The empirical evidence resulting from this thesis provides the following main messages: First, a focus on the means or processes rather than on the outcomes of personal goals is beneficial during goal pursuit since it is related to better self-regulation and higher subjective well-being. More specifically, focusing on the processes involved in goal pursuit might be beneficial for self-regulation when people make attributions for failure and success. Second, there is a shift from outcome to the more beneficial process focus across the life span. Third, self-regulation during goal pursuit seems to generally improve in old age. The transition to process focus and the improvement of self-regulation in old age can foster successful aging because both mechanisms can help adults to compensate for age-related resource restrictions.

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## ZUSAMMENFASSUNG

Um erfolgreich persönliche Ziele zu verfolgen und nach Misserfolgen und Rückschlägen nicht aufzugeben, müssen Menschen ihr Verhalten, ihre Gedanken und ihre Emotionen regulieren (Baumeister et al., 2007). Das Ziel, durch eine Diät an Gewicht zu verlieren, erfordert z.B. kalorienreichen Versuchungen zu widerstehen, nicht zu sehr darüber zu grübeln, wenn dies einmal nicht gelingt, und negative Stimmung aufzuhellen, wenn sich der Diäterfolg nur langsam einstellen will. Diese Dissertation untersucht, wie der *Zielfokus*, also das Nachdenken über die Mittel der Zielverfolgung (Prozessfokus) oder die mit der Zielerreichung angestrebten Ergebnisse (Ergebnisfokus; Freund et al., 2010), *Alter* und *Selbstregulation* zusammenhängen. Die Arbeit stützt sich dabei auf die Annahme, dass Prozesse der Selbstregulation davon beeinflusst werden, wie Ziele, also angestrebte Ergebnisse und Mittel zu ihrer Verfolgung (Kruglanski, 1996), kognitiv repräsentiert werden („Motivation-als-Kognition-Paradigma“, Kruglanski et al., 2002).

Teile I und II untersuchen die Hypothese, dass ein Prozessfokus im Gegensatz zu einem Ergebnisfokus mit erfolgreicher Selbstregulation beim Verfolgen persönlicher Ziele einhergeht. Dazu wurden in Teil I 126 Studienteilnehmerinnen während einer sechswöchigen Diät wiederholt gefragt, wie stark sie über die Mittel und die Ergebnisse der Diät nachdachten (Prozess- versus Ergebnisfokus). Hypothesenkonform zeigte sich, dass ein stärkerer Prozess- als Ergebnisfokus mit besserer Selbstregulation einherging, nämlich weniger Abweichungen von den Diätvorgaben, sowie weniger Rumination über Misserfolge und weniger disinhibitem Essverhalten. Ein stärkerer Prozessfokus war ausserdem positiv mit der Gewichtsabnahme während der sechswöchigen Diät korreliert.

Teil II umfasst zwei Studien. In einer Fragebogenstudie mit 129 Teilnehmenden wurde die Hypothese bestätigt, dass ein stärkerer Prozessfokus beim Nachdenken über persönliche Ziele positiv mit subjektivem Wohlbefinden zusammenhängt. Stärker auf die Mittel als auf die Ergebnisse zu fokussieren, hing ausserdem positiv mit der Absicht zusammen, nach einem Misserfolg eher die (nicht erfolgreichen) Mittel zur Zielverfolgung zu ersetzen als sich zugunsten

anderer (eher erreichbarer) Ziele vom ursprünglichen Ziel zu lösen. Diese Absicht wiederum korrelierte positiv mit dem subjektivem Wohlbefinden. In Studie 2, der oben bereits genannten Diätstudie, zeigten sich ausserdem signifikante Zusammenhänge zwischen der Tendenz, Erfolge und Misserfolge eher auf der Ebene der Prozesse des Diäthaltens (z.B. die Änderung des Essverhaltens) zu lokalisieren als auf der Ebene der angestrebten Ergebnisse (z.B. besseres Aussehen), und erfolgreicher Selbstregulation und Gewichtsabnahme. Teil I und II unterstützen somit die Annahme, dass es sich bei der Verfolgung langfristiger Ziele und insbesondere nach Misserfolgen für Selbstregulation und Zielerreichung auszahlt, stärker darüber nachzudenken, *wie* ein Ziel erreicht werden kann als darüber, *wozu* man es erreichen möchte.

Die Teile III, IV und V der Dissertation betrachten Zielfokus und Selbstregulation im Kontext ihrer Entwicklung über die Lebensspanne im Erwachsenenalter. Teil III befasst sich allgemein damit, wie Erwachsene durch das Setzen und Verfolgen von Zielen ihre persönliche Entwicklung gestalten. Die handlungstheoretische Spezifizierung des Modells der Selektion, Optimierung und Kompensation (Freund & Baltes, 2000; Freund et al., 1999; Freund, 2006a) dient als theoretischer Rahmen. Es wird ausserdem vorhergesagt, dass es im Alter aufgrund der Verkürzung der Zukunftszeitperspektive, durch Ressourceneinschränkungen und durch die verstärkte Zielorientierung, Verluste zu vermeiden anstatt Gewinne zu erzielen (Ebner et al., 2006; Freund, 2006b), zu einer Zunahme des Prozessfokus und einer Abnahme des Ergebnisfokus kommen soll.

In Teil IV werden drei Studien vorgestellt. Sie zeigen unter Anderem, dass, wie angenommen, ältere im Vergleich zu jüngeren Erwachsenen stärker auf Prozesse statt auf Ergebnisse der Zielverfolgung fokussieren (Studie 1,  $N = 43$ ), dass ein Prozessfokus mit höherem affektiven Wohlbefinden einhergeht (Studie 2,  $N = 89$ ), und sich dieser Prozessfokus positiv auf eine Reihe von Zielvariablen (wie die Zielzufriedenheit) und auf den tatsächlichen Erfolg bei der Verfolgung eines sportlichen Ziels auswirkt (Studie 3,  $N = 101$ ).



Teil V der Dissertation untersucht schliesslich die Hypothese, dass ein höheres Alter insgesamt mit einer besseren Selbstregulation einhergeht. Begründet wird dies damit, dass sich über die Lebensspanne Übungseffekte aus jahrelanger Erfahrung in der Verfolgung langfristiger Ziele akkumulieren. Ausserdem gibt es Befunde aus der Forschung zu Emotionsregulation (z. B. Gross et al., 1997) und Gedankenunterdrückung (z. B. Giambra, 1989), die auf positive Effekte des Alters auf die Selbstregulation hinweisen. Dem entgegen stehen allerdings zahlreiche Studien aus der psychologischen Forschung zur Entwicklung exekutiver Funktionen, die eine altersbedingte Verschlechterung der Fähigkeit unerwünschtes Verhalten zu inhibieren, gefunden haben (Verhaeghen & Cerella, 2002). Daten aus der Diätstudie bestätigen, dass ältere Frauen über eine bessere Selbstregulation ihrer Emotionen, ihrer Gedanken und ihres Verhaltens verfügen. Diese ging jedoch nicht mit höherem Gewichtsverlust einher, was aber durch die altersbedingte Abnahme des Energiegrundumsatzes erklärt werden kann (Bosy-Westphal et al., 2003).

Zum Schluss integriert eine umfassende Diskussion die verschiedenen Teile der Arbeit und diskutiert noch einmal ausführlich mögliche Mechanismen und Faktoren, die das Ausmass der Adaptivität des Prozessfokus bzw. der Maladaptivität des Ergebnisfokus beeinflussen könnten. Wieso ein offensichtlich funktionaler Prozessfokus nicht auch im jüngeren Erwachsenenalter vorherrscht, wird ebenfalls erläutert. Schliesslich wird die Wichtigkeit von Selbstregulation für eine erfolgreiche Entwicklungsregulation insbesondere im höheren Alter betont und hergeleitet, welche Mediatoren bei der Verbesserung der Selbstregulation im Alter eine Rolle spielen könnten. Am Ende werden praktische Implikationen der Forschungsergebnisse abgeleitet.

## APPENDIX

### **Appendix A: Self-developed questionnaire to assess dieting-related rumination after failure (in accordance with Kuhl, 1990)**

Please indicate how strongly you agree with the following statements regarding the past week:

1. Whenever I violated the dietary requirements, I could not concentrate very well on other things.
2. \*Whenever I violated the dietary requirements, I did not think about it afterwards.
3. Whenever I violated the dietary requirements, it took me a long time to accept it.
4. Whenever I violated the dietary requirements, it came to mind repeatedly for quite a while afterwards.
5. Whenever I violated the dietary requirements, I quickly accepted it.
6. Whenever I violated the dietary requirements, I did not get over it very quickly.

(Note: Scale range 0 = *not at all* to 6 = *very much*, reversely coded items are marked with an asterisk)

**Appendix B: Self-developed questionnaire to assess disinhibition after failure**

Please indicate how strongly you agree with the following statements regarding the past week.

1. \*Whenever I violated the dietary requirements, I ate less afterwards.
2. Whenever I violated the dietary requirements, I sometimes ate quite a lot afterwards.
3. \*Whenever I violated the dietary requirements, I compensated for it by eating less afterwards.
4. Whenever I violated the dietary requirements, it did not matter anyway and I gave up dieting for that day.
5. \*Whenever I could not resist temptation, I ate fewer calories sometime later.
6. Whenever I could not resist temptation, I stopped dieting for that day.

(Note: Scale range 0 = *not at all* to 6 = *very much*, reversely coded items are marked with an asterisk)

**Appendix C: Self-developed questionnaire to assess means substitution (MS) vs. outcome substitution (OS) after failure**

1. \*When things don't go as well as they used to,
  - a) ... I look for other ways of achieving my goal. (MS).
  - b) ... I prefer to turn towards other goals. (OS)
2. \*When I can't do something important the way I used to,
  - a) ... I look for a new goal. (OS)
  - b) ... I look for other ways of doing it. (MS)
3. \*If I can't accomplish something as well as I used to,
  - a) ... I try to accomplish it another way first. (MS)
  - b) ... I try to accomplish other things first. (OS)
4. When I have difficulties achieving a goal,
  - a) ... I look for other ways and means to achieve it. (MS)
  - b) ... I prefer to turn towards more realistic goals. (OS)
5. When I experience setbacks,
  - a) ... I don't give up my goal: There are still other ways to pursue it. (MS)
  - b) ... I prefer to give up my goal: There are enough other desirable goals to pursue.  
(OS)

(Note: Items marked with an asterisk were formulated according to Baltes, Baltes, Freund, & Lang, 1999)

**Appendix D: Introduction to the two “thinking exercises”****Thinking exercise A (process focus):**

“We all pursue our goals in certain ways. We can examine our behaviour and its connection with general life goals. This is what we want to demonstrate to you with the following example: Most people pursue the goal of being physically active. How? Exercising regularly. How? Joining a sports club. As you can see, there are different ways in which we can try to attain our goals.

Thinking exercise A focuses your attention on *how* one pursues goals.”

**Thinking exercise B (outcome focus):**

“For everything we do, there is always a reason why we do it. We can often trace our behaviour back to general life goals. This is what we want to demonstrate to you with the following example: Most people pursue the goal of getting some exercise. Why? To improve their health. Why? To just feel good in general. As you can see, there are different reasons why we behave in certain ways. Thinking exercise B focuses your attention on *why* we pursue certain goals.”

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